Iroquois Falls Forest
Independent Forest Audit
2005-2010
Audit Report

KBM FORESTRY CONSULTANTS INC.

349 Mooney Avenue
Thunder Bay, Ontario
Canada P7B 5L5
Bus: 807-345-5445
www.kbm.on.ca

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1.0 EXECUTIVE SUMMARY

This report, for the Iroquois Falls Forest (IFF or 'the Forest'), documents the results of an Independent Forest Audit conducted by KBM Forestry Consultants Inc. All Crown forests in Ontario are required to be audited at least every five years; the requirement for independent audits arising from MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario (2003). Regulation 160/04 of the Crown Forest Sustainability Act (S.O. 1994, c. 25) (CFSA) sets out the specific requirements for conducting the audits.

The audit covered the five-year period April 1, 2005 to March 31, 2010. It assessed implementation and selected aspects of planning of the final five years of the 2005-10 FMP and planning for the 2010-20 FMP which was not finalized and instead became the 2010-12 Contingency Plan for the amalgamated Cochrane Area Forest (subsequently the Abitibi River Forest). The on-site component of the audit occurred from September 13 to 27, 2010. Document review and interviews occurred throughout the audit process. During the audit term the Forest was managed under an SFL held by Abitibi-Consolidated Company of Canada. The principal auditees were Abitibi-Consolidated Company of Canada and the MNR Cochrane District.

Based on the audit, 26 recommendations were made. Recommendations arise from audit team's observations of material non-conformances, or may be developed to address situations in which the audit team identifies a significant lack of effectiveness in forest management activities. All audit recommendations are directed at either MNR or Abitibi River Forest Management Inc., a cooperative SFL holder who assumed management responsibilities on the Abitibi River Forest effective April 1, 2010. The majority of recommendations centred on deficiencies in the area of forest management planning. However, the key recommendations, discussed below, arose from audit team's observations made in the field. A best practice was identified for the ongoing multi-partner woodland caribou research project that is providing valuable information to inform forest management planning and another for the comprehensive monitoring of silvicultural effectiveness and compliance by MNR.

Of the 26 audit recommendations there are three areas of concern that are considered key since they highlight the need to significantly alter certain current practices on the Forest in the interest of sustainability. The first area of concern arises from the lack of clear direction from the Province that has allowed forest operations to leave significant amounts of waste wood fibre (slash) at roadside where it occupies productive forest land and prevents establishment of regeneration. This practice is not unique to the IFF or the amalgamated Abitibi River Forest; management of waste wood fibre (both slash and chipper debris) has been a recurring issue for years as evidenced by the many recommendations made in previous IFAs across Ontario. Only a change at the Provincial policy level, supported by forest management plan commitments and enforcement of such commitments through the Provincial compliance program is likely to lead to an effective, permanent solution. The second area of concern is associated with implementation of harvesting patterns that protect existing regeneration on upland sites. In the audit team's view this practice will lead to the degradation of future stand composition through retention of less desirable species that will form a higher component of the new stand, and reduced productivity due to the inherently higher levels of competition on upland sites, resulting in lower stocking levels. A third related area of concern is the retention of mature larch seed trees in harvest blocks which is also contributing to a significant increase in the larch component on lowland sites.

The audit team concluded that management of the Iroquois Falls Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Abitibi Consolidated Company of Canada. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol.

No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc. for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.

Rod Seabrook, EP(EMSLA)
Lead Auditor, on behalf of the audit team

2.0 TABLE OF RECOMMENDATIONS AND BEST PRACTICES

Recommendation on Licence Extension
The audit team concludes that management of the Iroquois Falls Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Abitibi Consolidated Company of Canada. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc. for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.

Recommendations Directed to the SFL Holder / MNR District
Recommendation 1: MNR must ensure that the Local Citizens Committee Terms of Reference are updated to meet the content requirements of the FMPM.
Recommendation 2: MNR must ensure that public notices are placed to allow the required public inspection periods to be met.
Recommendation 3: MNR must ensure that public notice letters contain all the content required by the Forest Management Planning Manual.
Recommendation 4: MNR must ensure that the Steering Committee meets as required during the development of the 2012-22 Forest Management Plan and that minutes for those meetings are recorded, distributed to planning team members and included in the Forest Management Plan supplementary documentation.
Best Practice 1: The ongoing multi-partner woodland caribou study is an excellent example of applied research that has provided and continues to provide significant science-based contributions to forest management planning.
Recommendation 7: Abitibi River Forest Management Inc. must ensure that the next Forest Management Plan contains biological or silvicultural rationale for planned clearcuts greater than 260 ha.
Recommendation 8: Abitibi River Forest Management Inc. must consider the harvest profile selected in the 2010-12 Contingency Plan when developing the profile for the next Forest Management Plan so that further substitution into younger age classes does not occur.
Recommendation 10: Abitibi River Forest Management Inc. must amend the utilization standards in the 2010-12 Contingency Plan to be consistent with the Northeast Region Operations Guide for Marketability Issues document or provide compelling rationale for the significant deviation from that direction document. The 2012-22 Forest Management Plan utilization standards should also conform to the Guide direction or provide rationale for departure.
Recommendation 11: The Abitibi River Forest planning team must consider on-the-ground results, current Provincial direction and the remote nature of a large portion of the Forest when modelling for productive land loss due to waste wood fibre in the 2012-22 Forest Management Plan.
Recommendation 13: Abitibi River Forest Management Inc. must include direction regarding management of chipping debris in the next Forest Management Plan.
Recommendation 14: Abitibi River Forest Management Inc. must consider the renewal profile selected in the 2010-12 Contingency Plan when developing the profile for the next Forest Management Plan and include sufficient analysis in the 2012-22 Forest Management Plan to justify the significant deviation from the planned Long Term Management Direction during the two year contingency period.
Recommendation 15: Abitibi River Forest Management Inc. must review the planned renewal assessment program in the 2010-12 Contingency Plan to ensure that the next Forest Management Plan covers the existing shortfall.

Recommendation 16: Abitibi River Forest Management Inc. must assess the stands listed as second pass in the 2010-12 Contingency Plan and, where three or more years have lapsed since removal of the conifer, follow the Contingency Plan direction related to two-pass harvesting so successful renewal of the stands can occur.

Recommendation 17: Abitibi River Forest Management Inc. must ensure the slash management plan in the 2012-22 Forest Management Plan can meet plan objectives and guidelines focused on minimizing loss of productive land. Abitibi River Forest Management Inc. should also deal with treatable backlog areas of slash.

Recommendation 18: Abitibi River Forest Management Inc. must:

a) conduct an immediate review of all upland sites harvested under the Careful Logging Around Advanced Growth system since 2005 and implement remedial silvicultural treatments, where practical, on sites found not likely to become a silvicultural success
b) implement exceptions monitoring on all upland Careful Logging Around Advanced Growth sites for which the use of natural advance growth (without planting) as a regeneration method is deemed as not recommended under the Silvicultural Guide.

Recommendation 19: Abitibi River Forest Management Inc. must address the increased presence on the Forest of less desirable tree species such as larch and balsam fir.

Recommendation 20: Abitibi River Forest Management Inc. must ensure that aggregate pits are operated in accordance with the relevant standard.

Recommendation 21: Abitibi River Forest Management Inc. must address the backlog of area that requires assessment of natural regeneration.

Recommendation 22: Abitibi River Forest Management Inc. must ensure that sufficient system and staffing support is available to properly execute the Silvicultural Effectiveness Monitoring program.

Recommendation 23: Abitibi River Forest Management Inc. must address the backlog of Free to Grow surveys on the former Iroquois Falls Forest.

Best Practice 2: The monitoring of silviculture effectiveness and compliance by the Ministry of Natural Resources during the audit term was deemed to be excellent.

Recommendation 24: MNR must conduct spot checks on the outstanding suspension reports and determine any compliance action to be taken.

Recommendation 26: The Cochrane District Manager must ensure that the submission timeline for the Independent Forest Audit Action Plan Status Report is met.

Recommendations Directed to Corporate or Regional MNR

Recommendation 5: Corporate MNR, in consultation with the Ministry of Environment, must investigate and report upon lessons learned in the amalgamation and associated planning challenges encountered in the creation of the Abitibi River Forest to ensure information management systems and other procedures are adequate to deal with future amalgamations.

Recommendation 6: Corporate MNR must consider requiring that trade-off analysis be conducted using an appropriate decision support tool on amalgamated forests.

Recommendation 9: MNR Region must update the *Northeast Region Operations Guide for Marketability Issues* document as follows:

- reduce the allowance for residual standing trees to no more than 25% canopy closure to better align the Guide with inventory standards
- incorporate a requirement to provide information, in addition to the current Forest Resource Inventory description, to confirm actual stand conditions prior to finalizing operational plans
- clarify the allowance for bringing unmarketable trees to roadside in order to minimize the loss of productive area along roadways

Recommendation 12: Corporate MNR must develop a policy to address waste fibre management, consistent with the intent of minimizing losses of productive forest land, and provide associated direction to MNR regions, districts and the forest industry, including standards for acceptable allowances for conversion of productive forest land to non-productive forest land. MNR should also periodically report to the public the cumulative loss of area and growing stock potential due to forest land occupied

by waste fibre.
Recommendation 25: Corporate MNR must review the reporting procedures and consider modifying them to recognize multiple successional pathways to improve the adaptive management process.

3.0 INTRODUCTION

3.1 Audit Process

Independent Forest Audits (IFAs) are a requirement of the Crown Forest Sustainability Act (S.O. 1994, c.25) (CFSA) and the Forest Management Class Environmental Assessment on Crown Lands in Ontario. Every forest management unit in Ontario must be audited by an independent party at least once every five years. The Independent Forest Audit Process and Protocol (IFAPP) was developed by MNR to provide a comprehensive and consistent method of evaluating forest management activities on Crown land. It serves as a framework that provides a structured approach to evaluating whether or not forest management activities meet the requirements governing forestry practices on Crown land in Ontario.

Fifth year IFAs of the Cochrane-Moose River Management Unit (CMRMU), Iroquois Falls Forest (IFF) and Smooth Rock Falls Forest (SRFF) were conducted for the period April 1, 2005 to March 31, 2010 by KBM Forestry Consultants Inc. (KBM) in 2010 in accordance with the *Crown Forest Sustainability Act*, Section 26(3). At the time of audit the three forests were in a state of transition in terms of forest management responsibilities. On April 1, 2010 they were amalgamated with the Nighthawk Forest to form the Abitibi River Forest.

A cooperative shareholder agreement was signed in January, 2010 that formed a new management company, Abitibi River Forest Management Inc. (ARFMI). An SFL for the Abitibi River Forest was issued to ARFMI in October 2010, covering the term April 1, 2010 to March 31, 2030. Until the new SFL was in place, forest management responsibilities resided with AbiBow (Iroquois Falls Forest), Tembec (Smooth Rock Falls Forest), and the Cochrane District MNR (Cochrane-Moose River Management Unit). ARFMI has entered into a service provider contract with First Resource Management Group Inc. (FRMG). FRMG is currently transitioning the forest management activities and was the point of contact for the IFA.

Within the report the audit team has made recommendations to address instances of non-conformance to a law and/or policy, or an identified lack of effectiveness in forest management activities. Recommendations are listed in the table in the previous section and presented within the main body of the report together with a brief description of the issue leading to the recommendation. A full discussion of the issue, including the link to the IFAPP principle, criteria and audit procedure, associated background information, summary of evidence and conclusion leading to the recommendation is contained in Appendix 1.

As the new SFL is in place, related audit findings are now directed to ARFMI, instead of the individual forest managers responsible during pre-amalgamation. Audit recommendations related to responsibilities of MNR continue to be directed to the appropriate organizational level within MNR. More detailed information on the audit process and sampling is provided in Appendix 4 of this report.

KBM conducted the IFA on the IFF for the five-year period April 1, 2005 to March 31, 2010. Audit team members and their qualifications are presented in Appendix 6. The audit assessed portions of planning and implementation as described in Table 1.

Table 1. Forest management plans within audit scope

Implementation and selected aspects of planning	2005-10 Iroquois Falls Forest FMP
Planning	2010-20 Cochrane Area Forest* FMP - planning process and LTMD development: Note this plan did not proceed to completion and was replaced by the 2010-12 Contingency Plan for the Cochrane Area Forest, referred to below.
	2010-12 Contingency Plan - Cochrane Area Forest planning process and development

* The Cochrane Area Forest has become the Abitibi River Forest consisting of the former Cochrane-Moose River Management Unit, Smooth Rock Falls Forest, Iroquois Falls Forest, and the Nighthawk Forest.

3.2 Management Unit Description

The Iroquois Falls Forest is located in the Northeast Region of the Ontario Ministry of Natural Resources. Approximately eighty per cent of the forest is within the administrative District of Cochrane and twenty per cent is within the administrative District of Kirkland Lake. Cochrane District is the lead administrative district for the IFF and Kirkland Lake District has direct input into the planning and administrative responsibilities for areas within that district.

Abitibi Consolidated Company of Canada Inc., a subsidiary of AbiBow, was the Sustainable Forest License holder on the IFF during the audit term. The Forest is the main fibre supply for the company's newsprint mill in Iroquois Falls, Ontario. Other major users of fibre from the IFF have included Tembec Inc., Grant Forest Products (Georgia Pacific) and Norbord (True North Plywood).

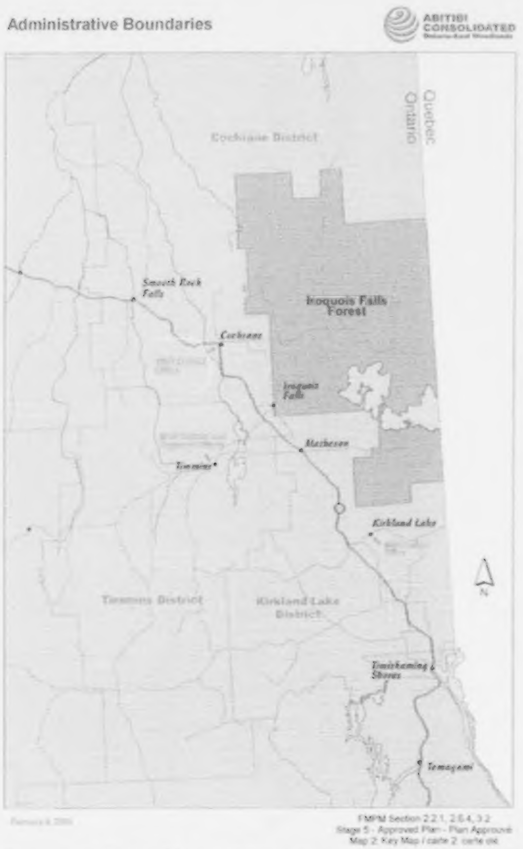
Administrative Boundaries
ABITIBI CONSOLIDATED
Quebec
Ontario
Cochrane District
Smooth Rock Falls
Iroquois Falls Forest
Cochrane
Iroquois Falls
Matheson
Timmins
Kirkland Lake
N
Timmins District
Kirkland Lake District
Temiskaming Shores
Temagami
FMPM Section 2.2.1, 2.6.4, 3.2
Stage 5 - Approved Plan - Plan Approuvé
Map 2: Key Map / carte 2: carte clé

Figure 1. Location of the Iroquois Falls Forest (Source: 2005-2010 Iroquois Falls Forest FMP)

The Iroquois Falls Forest contains a total land base (excluding patent land) of 1,168,091 hectares including water, non-forested land and forested land. The major portion of the Iroquois Falls Forest lies within the distinct physiographic section of the Boreal Forest known as the Great Northern Clay Belt. The most northerly portion of the Forest is situated on the James Bay coastal plain and that part of the forest south of Lake Abitibi is located within the Central Transition Zone. The climatic region is classed as modified continental, since weather conditions are slightly modified by the Great lakes and Hudson Bay. The climate is characterized by short, warm summers and long, cold winters.

The clay soils on the Forest have been derived from sediments deposited by post-glacial Lake Barlow-Ojibway during the retreat of the last ice age. Because of the lake deposits, clays and clay-loam soils underlie most of the Forest. These are interspersed with occasional outcrops of Pre-Cambrian granites, gneiss and schists and by north-south sand and gravel eskers and outwash sandy plains. An outstanding example of a jack pine covered esker is the Munro system, which extends from north of Lake Abitibi south for a distance of over 100 kilometres. Peat and organic soils, overlying the marine sands and clays, resulted from the deposition of vegetative matter in association with poorly drained land creating extensive areas of swamps and bogs.

The Forest is characterized by stretches of stands of black spruce on gently rising uplands or on lowland flats. Up to fifty per cent of the productive forest land is found on peatlands which are dominated by black spruce. On the lowland flats, black spruce alternates with extensive sedge fens and sphagnum bogs. Well over 50% of the soils on the Iroquois Falls Forest are moist to wet. Forest operations on these sites are largely restricted to winter. Hardwood or mixedwood stands of trembling aspen, balsam poplar, balsam fir and white and black spruce are found on better-drained sites. Jack pine is found on drier sites such as outwash deposits, old beaches and eskers. White birch is prominent on sandy soils.

3.3 Current Issues

The IFAPP requires a review of High Priority Aspects (HPAs) of the auditees' systems or activities. These are areas of potential focus during the audit related to key issues or management challenges during the audit term. A discussion of potential HPAs on the amalgamated Forest was held during the pre-audit meeting and three HPAs were subsequently included in the Audit Plan, as follows.

1. Underutilization of unmarketable species such as balsam fir
2. Compliance issues on the Marceau Road (former Smooth Rock Falls portion)
3. Staff turnover and layoffs in the forest industry

In addition, the audit team deemed that there were other issues that needed specific focus during the audit, specifically:

4. The severe economic downturn in the forest products industry significantly reduced actual harvest levels compared to planned levels during the audit term. The AbiBow harvest operation was shut down between March 2009 and December 2009, due to market conditions and entering into bankruptcy protection. Operations restarted in January 2010. The economic downturn also aided in the permanent closure in 2006 of Tembec's pulp mill in Smooth Rock Falls and indefinite closure of their sawmill in Timmins. A labour dispute in 2006 and depressed markets for OSB also led to idling of the Grant Forest Products OSB mill in Timmins; this mill is still idle.
5. Burning of roadside logging slash was not conducted since 2007 and all slash piling ceased in 2008. This will result in areas of productive land being unavailable for regeneration if left in their current state.

All of the issues identified above were reviewed during the audit and comments and recommendations emanating from the audit findings are incorporated into the audit report as appropriate.

3.4 Summary of Consultation and Input to Audit

Opportunities were provided throughout the audit process for consultation with and input from auditees and other interested parties. The audit team spoke with staff from MNR, AbiBow, Tembec, FRMG, Local Citizen Committee (LCC) members, wood supply commitment holders, and members of four First Nation (FN) communities. In addition, comments were received in response to a questionnaire made available to the public. A summary of the methods and input is provided in Appendix 4.

4.0 AUDIT FINDINGS

4.1 Commitment

The Province has documented its commitment to sustainable forestry principally through the Crown Forest Sustainability Act. MNR, in turn, has documented policies and other guidance that establish its commitment to sustainable forestry and resource management, consistent with the requirements of the CFSA. These are communicated throughout MNR and are promoted with resource users and the general public. MNR maintains a public website where these commitments are available: http://www.mnr.gov.on.ca/en/Business/Forests/2ColumnSubPage/STEL02_163861.html

During the audit term AbiBow maintained certification of the IFF to the CAN/CSA Z809 sustainable forestry standard, changing to the SFI standard in 2009. Both standards are internationally recognized and require annual third party audits to ensure that the certificate holder remains in compliance with the requirements of the Standard. The most recent audit was conducted in 2010. The company's woodland division is also certified to ISO 14001, an internationally recognized environmental management system standard.

AbiBow has an Environmental Policy that includes a commitment to sustainability of natural resources and an Ontario Forestry Policy that lists a separate set of commitments specific to forest management. Commitment to sustainable forestry, as assessed through compliance to regulatory requirements and general conformance to the direction contained in forest management guides and forest management plans was demonstrated by both MNR and AbiBow during the audit term.

4.2 Public Consultation and Aboriginal Involvement

Three LCCs are associated with the Abitibi River Forest (Cochrane, Kirkland Lake and Timmins). A sample of LCC members contacted during the audit was satisfied with the performance of the committees, the support provided by MNR and the cooperation of the companies. There was a desire expressed by members for more representation on the LCCs from area Aboriginal communities. Despite ongoing efforts, as in other districts, securing Aboriginal representation on LCCs has been a challenge.

Some concerns were stated over the low turn out at information centres, and the advertising style and frequency of public notices. Minutes of LCC minutes indicated overall acceptable levels of attendance by members and a good coverage of topics. Terms of Reference for the individual LCCs were current; however, the Cochrane LCC Terms of Reference (updated version March 2009) did not meet all the content requirements of the 2004 FMPM.

Recommendation 1: MNR must ensure that the LCC Terms of Reference are updated to meet the content requirements of the FMPM.

The Cochrane Area LCC is the lead LCC for forest management planning on the Abitibi River Forest and there was active participation on the planning team during planning for the 2010-12 CP. The Committee was reorganized in 2006 in response to concerns raised during the previous IFA about the functionality of the Committee. The reorganization appears to have been effective in addressing the concerns. Members found meetings productive and informative; dialogue is very much encouraged and questions are welcomed.

MNR provided adequate support for the LCC and has kept LCC members up to date on current events, answered questions in a quick and timely manner, and ensured minutes were distributed after each meeting. According to LCC member interviews and questionnaire responses, the MNR District Manager and SFL holder attended most meetings where topics of interest were discussed and evidence was presented that demonstrated LCC involvement in the categorization of amendments. LCC members found AbiBow and Tembec representatives to be cooperative and reasonable; they listened to concerns with an open mind and tried their best to address issues.

In general, the public does not use the LCC as a method of raising concerns or accessing information on forest management. Most members of the LCC do not formally report back to the stakeholder group they represent. If and when they did, it was generally in the form of a casual conversation.

Multiple learning opportunities were provided to members of the LCCs (e.g. forum in Sault Ste. Marie, Aboriginal Sensitivity Training, Caribou Planning, Bearwise). Most members had attended at least one event, and were aware of the other events that were available.

There were no concerns that led to implementation of the issue resolution process during planning.

Fifteen amendments were made to the 2005-10 FMP, 14 of which were administrative in nature. Amendment #10 (minor) covered planning for road construction; decommissioning and abandonment of

Perch Lake Road, road name changes and removal of a caribou calving area. Public notices were placed in four English and two French language newspapers and Wawatay News, an Aboriginal publication. The planned insertion date was August 6, 2008; however the actual insertion dates were August 7 for the Iroquois Falls *The Enterprise* and the *Cochrane Times,* and August 8 for the French language *Cochrane Times-Post.* The ad stated that the 15 day inspection period started August 6 and ended Aug 21; therefore the stated inspection period was not provided for the papers noted.

Recommendation 2: MNR must ensure that public notices are placed to allow the required public inspection periods to be met.

As part of the public notice for Amendment #10 letters were sent to persons and organizations on the District mailing list including area First Nations and Aboriginal organizations. The public notice letters were missing information required by the 2004 FMPM. For example, the FMPM requires that the letter contain "a statement that further public consultation may be required if concerns are raised."

Recommendation 3: MNR must ensure that public notice letters contain all the content required by the FMPM.

Seven First Nation communities were included in the Aboriginal consultation. This coincided with preparation of the 2010-20 FMP (subsequently the 2010-12 CP) for the Cochrane Area Forest.

Flying Post reserve is on west side of the Romeo Mallete Forest and was not interested in engagement during the development of the 2010-12 CP but asked to be made aware of any issues that may involve their traditional territory. There are no residents occupying the reserve at this time. Mattagami First Nation is located at the southern end of the Romeo Mallete Forest. This group once had a forest contracting business and had some contracts with Domtar; however they are not currently interested in conducting forestry operations. Matachewan is also more associated with the Timiskaming Forest and Nighthawk Forest. Due to location, opportunities were limited for the communities of Flying Post, Mattagami, Matachewan and Beaverhouse.

All seven FNs were invited to participate on the 2010-12 CP (originally the 2010-20 FMP). Flying Post noted that they did not have any involvement with the process but asked to be kept informed. Prior to the audit a letter was received from the Metis Nation of Ontario voicing concern that they were not given the opportunity for their own consultation process. This letter was addressed by the lead auditor.

Document review and interviews with Aboriginal, company and MNR representatives indicate that all requirements pertaining to Aboriginal consultation were met during the development of the 2010-12 CP.

4.3 Forest Management Planning

Planning Team

Through interviews with company and MNR staff and a review of the 2010-12 CP and Supplementary Documentation, it was determined that planning team derivation and development of the Terms of Reference met all FMPM requirements with one exception - the Terms of Reference was not approved until after the Notice of Invitation was released. The Terms of Reference for the current planning effort (2012-22 FMP) was developed and approved in accordance with the FMPM prior to issuing the Notice of Invitation so no recommendation is required because corrective action has already occurred.

The amalgamation of four forests managed by three agencies, across three Districts created numerous procedural and technical challenges. In addition, the collapse of forest markets led to a loss of revenue to SFL companies. Given these circumstances, it is not surprising that the planning team encountered delays in meeting some checkpoints (i.e. planning inventory and base model) early in the planning process for the 2010-20 FMP. In the final year of plan preparation, these delays had been overcome and the long term management direction was approved. This represents quite an achievement and reflects well upon the individuals and their organizations involved in the planning process under such challenging circumstances.

It may have been possible to have an approved plan in place for 2010, but the remaining time lines were short. In addition, there were concerns that the Caribou Conservation Plan and other regulations arising from the 2007 Endangered Species Act would have a significant impact on a newly approved plan, possibly leading to requests for an Individual Environmental Assessment (EA bump up) or the need for significant amendments. These factors led to a determination by the Steering Committee that a contingency plan would be required.

Compared to an FMP, a contingency plan allows less time for public and MNR review. The reasons for going to a contingency plan were properly documented in the contingency plan proposal; however, some planning team members questioned the need for a contingency plan because, in their opinion, sufficient progress had been made in developing the 2010-20 FMP at the time the decision was made. It would appear that the Steering Committee's rationale for a contingency plan was not fully understood by all planning team members.

The Steering Committee plays an important role in the planning process. The Steering Committee only met twice during the development of the 2010-12 CP, contrary to the Terms of Reference which called for quarterly meetings, and no minutes were recorded for those meetings. The 2009 FMPM directs the Steering Committee to monitor planning progress.

Recommendation 4: MNR must ensure that the Steering Committee meets as required during the development of the 2012-22 FMP and that minutes for those meetings are recorded, distributed to planning team members and included in the FMP supplementary documentation.

Plans

The 2010-12 CP lacked a forest management unit description section. While this was consistent with the approved Contingency Plan Proposal, the FMPM states "*A contingency plan is an interim forest management plan that is required when special circumstances affect the implementation of a forest management plan*". In the audit team's view, a new forest created through amalgamation should have an interim forest management plan that contains a description of the new forest. The amalgamated Abitibi River Forest illustrates the need for MNR to consider the implications of large scale forest amalgamations in not only meeting FMPM requirements but in determining, for example, how LCCs are formed, how roles are distributed among District offices and how trends analyses are interpreted. There are positive aspects of the amalgamation worth noting as lessons learned. The three Districts, in cooperation with the LCCs, developed a protocol that was followed to allow for efficiencies in the delivery of various services.

Questions emerge from the amalgamation that deserve further consideration. For example, since all of the forests had data that met the Forest Information Manual (FIM) requirements, why did it take such a lengthy period of time to develop the planning inventory? Are there problems with FIM or were there inadequate resources to bring the inventory together? Why does the MOE and MNR not consider a forest description for a new forest to be important in a Contingency Plan? Are there redundancies in the planning manual describing the required content of a management plan?

Recommendation 5: Corporate MNR, in consultation with the Ministry of Environment, must investigate and report upon lessons learned in the amalgamation and associated planning challenges encountered in the creation of the Abitibi River Forest to ensure information management systems and other procedures are adequate to deal with future amalgamations.

According to interviews, the 2012-22 FMP under development is already considering a contingency plan requirement for its first year of operation. If a new contingency plan is developed it should include the forest management unit description section.

The plan text and analysis package provided a clear and accurate description of the Sustainable Forest Management Model development. While technical aspects of the model were complete, more sophisticated planning models (i.e. spatial planning tools) could have aided in the analysis of planning issues surrounding the trade-off between socio-economic and non-timber objectives; this is discussed in Recommendation 6, below.

It is apparent that amalgamation allowed for meeting the current planned industrial demand for fibre that otherwise would likely not have been met if each forest prepared separate plans. The long term management direction (LTMD), age class substitution and allocation pattern selected in the 2010-12 CP are a concern with regards to sustaining the flow of forest benefits over the long run.

- The LTMD allows for decreases of some cover types to as low as 70% when compared to levels derived by simulation of fire events at the amalgamated forest level and as low as 40% within subunits. Typically, forests in Northwestern Ontario use a minimum level of 80% relative to levels derived by simulation of fire events. According to ARFMI, forest management plans in Northeastern Ontario most often use a minimum level of 65-70% in the "tests of sustainability". There is no Provincial standard threshold at this time but some direction is expected with the pending release of the *Forest Management Guide for Boreal Landscapes*.
- The harvest allocation also had considerable amounts of substitution of younger forest compared to older age classes identified by the strategic model (SFMM). If these age class substitutions were to continue over the long term, the forecasted flow of forest benefits and other objectives will not be achieved. The age class substitution is discussed in more detail later in this section.
- The LTMD and selected allocation pattern has led to a form of forest zoning, with longer harvest rotations being associated with more distant forests and caribou habitat while shorter rotations are found near mills. This strategy seems reasonable but is not adequately described in the plan in a way that could be grasped by the general public.

The Abitibi River forest is an example of a forest operating at a scale more consistent with the *Forest Management Guide for Boreal Landscapes*. Such a scale should allow for better solutions to landscape-level issues. However, the reporting of various forest cover indicators at this large scale may come at the expense of localized issues such as representation of certain forest cover types within some management sub-unit locations. Models other than SFMM allow such trade-offs to be more transparent at different scales of resolution. Given the pressure on wood supply and non timber values, the preparation of forest management plans on amalgamated forests would benefit from a more careful analysis of trade-offs at different scales using additional decision support tools.

Recommendation 6: Corporate MNR must consider requiring that trade-off analysis be conducted using an appropriate decision support tool on amalgamated forests.

MNR should consider requiring that the associated FMP document an acceptable rationale when the decision is made not to use such a tool.

Modelling

Two models were used to define the social and economic impacts of the 2010-12 CP selected management strategy – MNR's Socio-Economic Impact Model (SEIM) and a Regional Community Constellation Impact Model (RCCIM) developed by the Lake Abitibi Model Forest. Normally, only SEIM is used in planning. This extra effort in describing socio-economic impacts using RCCIM is commendable; however, many details are left in the supplementary documents and little explanation is offered in the text of the plan. For example, a section reads; "Wages and salaries will account for 62.0% of Gross Provincial Income impact" without defining what this indicator means. Some additional expertise should be secured to help interpret the outputs of socio-economic models to both inform and report upon the development of the long term management direction. The Planning Team for the next forest management plan should build upon the successful use of a new socio-economic model by securing additional expertise to help interpret the model outputs and then properly report on the likely affects on the long term management direction.

Woodland Caribou

In 1998 a multi-partner research initiative was established to study woodland caribou. This study has contributed significantly to knowledge of caribou movement and range use. Further collaring and tracking of both caribou and wolves is planned.

Best Practice 1: The ongoing multi-partner woodland caribou study is an excellent example of applied research that has provided and continues to provide significant science-based contributions to forest management planning.

Harvest

Eligibility and selection criteria for harvest, renewal and maintenance were well described in the CP. Contingency area planning was also thorough and well done. Planning has occurred so that residual stand structure requirements can be met. This includes provision of insular/peninsular areas, individual residual trees and downed woody material for wildlife use in planned harvest areas.

Yield curves developed for the 2010-12 CP were reduced by volumes planned to be left to meet residual requirements and are reasonable for the Forest. Table FMP-19 contains a summary of planned wood fibre dispersal that indicates achievement of all volume commitments and business arrangements. The 2010-12 CP contained a number of planned clearcuts greater than 260 ha in size however the plan lacked the required rationale.

Recommendation 7: ARFMI must ensure that the next FMP contains biological or silvicultural rationale for planned clearcuts greater than 260 ha.

Planned harvest in the 2010-12 CP includes a significant amount of age class substitution - about 9,000 ha. The original intent was to re-align the allocation over the remaining eight years of the planned 2010-20 FMP but, according to interviews with MNR staff, the new plan is to produce a 2012-22 FMP. Due to the severe downturn in the forestry sector it is highly unlikely that the full planned harvest will be realized, so there is little risk to forest sustainability due to the age class substitution. The short term of the CP (two years) was also considered in this determination. However, the audit team has a concern regarding further/continued age class substitution on the Forest.

Recommendation 8: ARFMI must consider the harvest profile selected in the 2010-12 CP when developing the profile for the next FMP so that further substitution into younger age classes does not occur.

Direction regarding utilization in the 2010-12 CP was adapted from the *Northeast Region Operations Guide for Marketability Issues* (Apr, 2008). The Northeast Guide is considered a thoughtful resource for use by forest management planners to keep compliant with the requirements of the Scaling Manual but there are issues with the amount of residual canopy considered acceptable under the Guide. In addition, there is no formal requirement to complete pre-harvest ground verification of forested conditions and the allowance for bringing unmarketable trees to roadside under the Guide could lead to loss of productive land.

Recommendation 9: MNR Region must update the *Northeast Region Operations Guide for Marketability Issues* document as follows:

- reduce the allowance for residual standing trees to no more than 25% canopy closure to better align the Guide with inventory standards
- incorporate a requirement to provide information, in addition to the current FRI description, to confirm actual stand conditions prior to finalizing operational plans
- clarify the allowance for bringing unmarketable trees to roadside in order to minimize the loss of productive area along roadways

The 2010-12 CP allows the leaving of up to 70 residual standing trees on all sites which is a considerable departure from the Guide direction (i.e. leave between 25 and 50 residual trees on conifer sites). There was no rationale provided in the FMP for this deviation. Considering the Guide is the local resource used to aid in keeping utilization standards compliant with the Scaling Manual, the Guide direction should have been closely adhered to.

Recommendation 10: ARFMI must amend the utilization standards in the 2010-12 CP to be consistent with the Northeast Region Operations Guide for Marketability Issues document or provide compelling rationale for the significant deviation from that direction document. The 2012-22 FMP utilization standards should also conform to the Guide direction or provide rationale for departure.

Modelling for the 2010-12 CP included forecasting productive land losses due to waste wood fibre (i.e. slash). No conversion was modelled after 30 years as all roads were assumed to be in place and slash disposal methods (e.g. biomass utilization) were expected to reduce slash losses to 0%.

Considering minimal on-the-ground improvement has occurred in slash management over the past 30 years and much of the Forest is very remote, the audit team believes the model assumption of no slash losses after 30 years is overly optimistic.

Recommendation 11: The Abitibi River Forest planning team must consider on-the-ground results, current Provincial direction and the remote nature of a large portion of the Forest when modelling for productive land loss due to waste wood fibre in the 2012-22 FMP.

The 2010-12 CP includes modelling allowances and a corresponding slash management plan that, if fully implemented, would free-up about 108 ha of productive lands but also permits the conversion of significant amounts of forested land to non-forest condition. The slash planned to be left will be a considerable physical and chemical impediment to renewal of this productive Crown land. Significant amounts of unmanaged roadside slash were observed during the field audit (See Section 4.4).

Recommendations related to recovering productive Crown forest land along roadways from waste fibre span the entire period since the beginning of the IFA process (1996) and were the subject of recommendations during the Forest Management Agreement (FMA) Reviews that predate the IFAs. These recommendations range across virtually every management unit in the Northeast and Northwest Regions and have typically been the subject of repeat audit findings. Recommendations have also been directed at Corporate MNR to provide clear direction on this subject. Despite this, MNR has only provided two somewhat ambiguous guidelines in the recently published Stand and Site Guide that will likely not lead to improvement in waste fibre management on Crown lands. Under current direction, the audit team believes that there will continue to be a significant long term loss of productive forest area to waste fibre.

Recommendation 12: Corporate MNR must develop a policy to address waste fibre management, consistent with the intent of minimizing losses of productive forest land, and provide associated direction to MNR regions, districts and the forest industry, including standards for acceptable allowances for conversion of productive forest land to non-productive forest land. MNR should also periodically report to the public the cumulative loss of area and growing stock potential due to forest land occupied by waste fibre.

According to company representatives there is a plan to increase in-bush chipping on the Abitibi River Forest in the near future. While in-bush chipping can reduce slash accumulation, chipper debris can become a localized issue; this has been observed by the auditors on several audits of management units in Ontario. There was no direction in the 2010-12 CP regarding management of chipping debris.

Recommendation 13: ARFMI must include direction regarding management of chipping debris in the next FMP.

Renewal

The 2010-12 CP silviculture ground rules (SGRs) were prepared in accordance with the FMPM and approved silvicultural guides and were consistent with the selected management alternative (SMA). A discrepancy was found between the modelled and planned silviculture program. According to the 2010-12 CP the planned overage in extensive activities during the two-year period was to be reconciled over the remaining eight years of the proposed ten-year plan (i.e. 2010-20 FMP). However, documentation and interviews indicate that a 2010-20 FMP is no longer scheduled; instead, a 2012-22 FMP is now being planned. Therefore the 2010-12 CP will become a stand-alone document and the deviation between modelled and planned renewal may not be reconciled. The deviation between modelled and planned renewal in the 2010-12 CP for the amalgamated forests, which select more extensive treatments than modelled, does not meet FMPM requirements.

Recommendation 14: ARFMI must consider the renewal profile selected in the 2010-12 CP when developing the profile for the next FMP and include sufficient analysis in the 2012-22 FMP to justify the significant deviation from the planned LTMD during the two year contingency period.

Silviculture support planned in the 2010-12 CP will meet planned renewal indicated in Table FMP-21 and planned planting/seeding densities. The current seed inventory is adequate to meet the proposed operations; however, two concerns related to silviculture support exist:

- The current first generation jack pine and black spruce tree improvement orchards are aging (currently about 25 years old); it will become more difficult each year to economically harvest seed from these sites. Plans to establish second generation orchards have been curtailed since 2004 due in large part to budgetary limitations. Failure to implement a succession strategy for the current seed orchards may lead to a significant shortage in available improved seed.
- Silviculture support planned would likely not support a more intensive program such as that modelled in the 2010-12 CP.

ARFMI should consider the longevity of current seed orchards and the likely needs of the Forest when determining seed requirements for future operations.

The plan text clearly identifies timelines for regeneration surveys for each forest unit and the assessment of not sufficiency regenerated or barren and scattered areas. Naturally regenerating conifer stands are surveyed six years post establishment to identify any required follow-up treatments. The assessment of Careful Logging Around Advanced Growth (CLAAG) areas for potential follow-up treatment is discussed; however, no survey timelines are defined in the plan. In addition, the plan does not address how artificially regenerated stands will be assessed for regeneration success and/or possible follow-up treatments prior to assessment for Free-to-Grow (FTG).

Table FMP-1 indicates 172,583 ha of Managed Crown Production Forest are below regeneration standards on the Cochrane Area Forest (89,865 ha are below regeneration standards on the former IFF). Assuming harvest and renewal rates were relatively equal over the past several years this equates to about 17,000 ha that require regeneration surveying annually; however Table FMP-25 indicates an average of approximately 11,000 ha is to be surveyed over the two-year period. The 2004 FMPM expects that the amount of area assessed for regeneration success "*should be consistent with the level of regeneration success required to meet plan objectives and the management strategy as well as levels of past disturbance (i.e., harvest and natural).*"

Recommendation 15: ARFMI must review the planned renewal assessment program in the 2010-12 CP to ensure that the next FMP covers the existing shortfall.

4.4 Plan Assessment and Implementation

Plan Assessment

The Iroquois Falls Forest consists of at least three readily defined forest areas – the northern section consists mainly of lowland black spruce stands growing on organic soils overlaying clay. The central section is mainly second-growth forest that is a result of the long history of forest management in the area. The southern section is relatively variable in topography, forest types and soils. This area is mainly Boreal but includes Great Lakes - St.Lawrence forest types in transition. The current inventory is a reasonable approximation of the forest condition.

Site productivity over large portions of the Forest, particularly in the northern section dominated by lowland stands, was noted to be quite variable due to nearness to the water table. Relatively small changes in elevation often led to significantly different forest types, even in very small blocks. This inherent variability was the cause of a significant audit finding related to careful logging in upland types. This is discussed within the renewal sub-section below.

Areas of Concern

The field portion of the audit included examination of a number of harvest blocks with AOCs to protect known values including water quality, remote tourism, a canoe route and a Provincial park. Examination from the air, on the ground and on supplemental aerial photography showed that AOC boundaries were maintained during harvesting operations. FMP and AWS direction was followed for the sample of AOCs viewed in the field and the prescriptions afforded appropriate protection to the values.

Harvest

A helicopter and ground transportation was used to access the field audit sites and GPS technology was used to confirm navigation to and within sites. During the field audit a variety of sites were viewed. Pre-harvest forest types included mainly conifer-dominated and some mixedwood stands as well as a few expansive hardwood stands. The field audit review included a selection of contractor work for each of the years audited. Due to the wet condition of many sites, the review included a number of winter operations but several non-winter sites were also viewed.

Actual harvest levels were well below planned for the audit term due to the sector downturn. For the 2005-10 period 60.3% of planned harvest was achieved (23,609 ha of 39,149 ha). Harvest operations consisted of bringing full trees to roadside for processing. Roadside operations included round wood and pulp wood processing with in-bush chipping for pulp.

Good harvest boundary control was noted during the field audit but there were a number of compliance inspection issues related to trespass. Most of these involved minor AOC incursions but trespass into unallocated area was also common. These trespasses were sometimes found by inspectors through review of supplemental aerial photography. Use of GPS technology has improved boundary layout and decreased the size of incursions and no trespasses have been documented since 2008. Procedures are in place to improve compliance with block boundaries so no recommendation is made in this audit.

Bypass of timber was minimized on sites viewed. Incidental merchantable pieces were noted in slash piles at some sites and merchantable stems used as pile ends were also noted at a number of sites but otherwise good utilization was noted in most blocks; particularly in light of the small piece sizes in many blocks. Operators in the area are very proficient with careful logging techniques and little damage to residual trees was noted.

Site disturbance was minimal except for one site in the southern section of the Forest which had relatively extensive site disturbance due to working on moist ground conditions outside the frozen period. AbiBow is reminded to follow procedures that minimize site disturbance on all sites.

AbiBow staff noted that stands exist that are awaiting a second pass harvest to remove poplar trees - this occurred because conifer was harvested from these sites then the market for poplar declined significantly and it was decided to leave the poplar standing for possible future use. One issue with these stands is that they were not originally planned as two-pass harvest and are not being tracked as such in annual reporting or the compliance program. The most important issue with these stands is that renewal efforts are being significantly delayed while waiting for a market for the poplar. If they are not harvested, the residual trees have the potential to interfere with the successful establishment and development of the subsequent stand.

Recommendation 16: ARFMI must assess the stands listed as second pass in the 2010-12 FMP and, where three or more years have lapsed since removal of the conifer, follow the CP direction related to two-pass harvesting so successful renewal of the stands can occur.

There has been a long history of slash management issues on the Iroquois Falls Forest. Previous IFAs on the Forest have all made recommendations regarding the need to improve slash management, with little resulting improvement on the ground. Both the 2005-10 FMP and the 2010-12 CP contain slash management strategies however, the slash management program delivered was not considered effective by the audit team and did not fulfill prior IFA recommendations and related action plans with respect to reducing slash on the Forest. Further, the slash management plan in the 2010-12 CP is deemed inadequate to minimize loss of productive Crown land. Looking forward, the current slash management plan will not meet the intent of the related guidelines in the Stand and Site Guide.

Recommendation 17: ARFMI must ensure the slash management plan in the 2012-22 FMP can meet plan objectives and guidelines focused on minimizing loss of productive land. ARFMI should also deal with treatable backlog areas of slash.

Silviculture

Implementation of renewal activities during the 2005-10 term was assessed through field examination and document review to confirm compliance with the CFSA and the approved FMP. The locations of renewal operations were consistent with the areas in the approved FMP and AWS.

The majority of renewal treatments viewed during the field audit were found to be consistent with the associated Forest Operations Prescription (FOP) and suitable to the site conditions; however, the audit team did have concerns with operational practices that are contributing to decreased silvicultural successes on upland sites. These are discussed in detail in the following sections. Issues were however found with FOPs corresponding with implemented activities on select area. Block 187 was found to have an SGR (Spruce/Pine plant, 04-040-04) which did not match the implemented treatment (naturally regenerated). Block 38 (Steele 13) was sheer bladed and planted however the corresponding SGR (04-040-04) prescribed direct planting without site preparation. It was noted that FOPs were seldom updated during the plan term which was largely attributable to limited post harvest assessments due to staff attritions and financial constraints.

During the audit period 23,609 ha were harvested and 39,262 ha were declared as being regenerated. Implemented renewal intensity was 71% extensive (i.e. natural renewal), 23% basic (i.e. some active regeneration undertaken to augment conifer composition) and 7% intensive (i.e. a suite of renewal activities undertaken to produce a conifer plantation). By comparison, the SMA silviculture intensity breakdown in the 2005-2010 FMP consisted of 56% extensive, 33% basic and 11% intensive. As indicated in the Comparison and Trend Analysis Report (TAR) – see Appendix 7; *'increased reliance on natural regeneration in the 2005-2010 period has been primarily due to budget constraints within the company'*

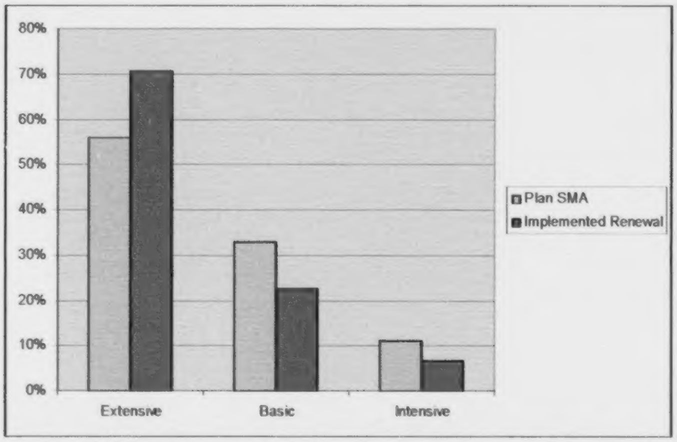

Figure 2. Planned vs. actual silviculture program

Planting:

During the term 67% of the planned area for planting was treated (11,506 ha) and a total of 15.55 million trees were planted; an average density of 1,351 trees/ha. Lower than planned planting densities (1,800 trees/ha) are largely attributable to CLAAG harvesting pattern being applied to areas prescribed for artificial regeneration reducing total available planting spots per ha through the retention of advanced growth. Some implementation issues were observed during the field audit, most notably tightly spaced seedlings. Company assessment records did however indicate that minimum quality standards were met throughout the term.

No direct seeding treatments were planned for the term due to previously implemented spruce seeding which yielded low germination success. Planting has traditionally been the preferred method of renewal for jack pine dominated sites on the IFF.

Site Preparation:

Site preparation targets for the term were under achieved by 59% with a total of 2,629 ha being treated – 6,336 ha were planned in the FMP. Budgetary constraints and a larger dependence on direct planting were the primary reasons for the FMP targets not being met. Power disk trenching operations were implemented on 817 ha (31%) while shear blading was used on the remaining area (1,822 ha, 69%).

Disk trenching activities, which were largely implemented on sandy jack pine dominated sites, were found to effectively expose mineral soils creating suitable microsites for seedlings. Excellent site coverage was noted and GPS tracking systems were used to map treated areas.

Shear blading operations were viewed on several blocks treated during the term. Shear blade prescriptions were based primarily on site slash load and soil texture. Blocks were treated during the winter to minimize soil exposure (heavy clays) and to maximize shearing efficacy. Bladed areas were variable in terms of pre-existing slash load and suited to heavy mechanical site preparation. Some areas showed very little evidence of blading relative to the size of slash windrows Block 38, Steele 13). Due to the predominant use of Trans Gesco clam bunk skidders in AbiBow's full tree logging operations, the audit team had difficulty in differentiating between bladed and non-bladed sites. The TAR states; "*the type of harvesting pattern where harvesters use travel corridors essentially prepares these corridors for subsequent planting without further site preparation*". Furthermore the methodology in determining suitable sites was found to be disorganized with no retention of site prescription records and lack of GPS tracking systems. Mapping was done manually, mostly on the ground but sometimes by air. Considering the high cost of heavy site preparation treatments it is important that proper methodologies for determining treatment prescriptions be followed and accurate records of treated areas be maintained. These concerns have been largely addressed through the procedures and protocols put in place by the current service provider on the Abitibi River Forest. FRMG has in place systems and staffing support which ensure the proper prescription and tracking of site preparation treatments.

Trenching on clay dominated sites is largely avoided due to the likelihood of frost heaving. Increased potential for seedling heaving may be true when using traditional scarification tools (power trenching, deep blading); however, intermittent patch mounding in heavy clay soils has been proven effective in many jurisdictions and provides many quantifiable advantages compared to direct planting (decreased heaving, deciduous competition control, raised microsite, increased nutrient availability/seedling growth, etc.). Properly implemented site preparation provides planting spots of the quality and quantity needed to meet regeneration standards. It is suggested ARFMI consider the use of alternate scarification tools to maximize site productivity; this could also allow for decreased herbicide use, particularly in areas prone to invasive grasses.

Slash piling was conducted on the IFF during the first two years of the term. Planned area targets of 528 ha for piling were underachieved by 45% during the term (289 ha piled). Underachievement of slash piling activities was due to program curtailments from 2007-2010. A total of 4,148 piles were burned in 2005 and 2006 – no targets for pile burning were included in the FMP.

Tending:

A representative sample of tending operations was examined for effectiveness in the field. Related documents were also reviewed to assess compliance with regulations and planned operations. The 2005 and 2006 program included the use of Vantage, 2,4D and Vision brand herbicides. Vision was primarily used in 2007 & 2008 due to low alder competition on target sites. During the audit period 76% (13,551 ha) of the planned area for tending was treated. Tending activities included treatment of 1,505 ha of barren and scattered and not sufficiently regenerated lands. AbiBow implemented tending operations in 2005 and 2006 on 182.5 ha of class Z lands (meet minimum stocking standards and only needed deciduous competition release to reach free growing status). Remaining class Z lands on the Forest totalled 4,381 ha.

There was a progressive decline in tending activities during the audit period. By 2008-09 only 56% of the annualized planned area was treated while no tending was done during 2009-10 due to fiscal constraints imposed by the company. An implementation shortfall of 24% was noted over the entire term. Formalized and documented tending assessment surveys were not conducted during the term. During the end of the plan term there was a marked failure to effectively carry out monitoring of regenerating stands in order to determine tending requirements. This was noted on several stops during the field audit (Challies 18, Boyer 10).

Tending areas were confirmed to be consistent with the approved FMP and were included in the AWS. The audit team found that as a whole, the aerial tending activities conducted during the term were satisfactory in achieving the intent of the FOP and the direction of the FMP. A field examination by the audit team revealed some implementation issues with the aerial spray program. These included instances of overspray into residual stands (Steele 15,) along with missed areas within the treated blocks (Dokis 12 &13). Also of note was the reduced efficacy of the aerial spray where a significant overstory of residual trees existed (Dokis 12). Tembec Inc., who is also a shareholder on the Abitibi River Forest has undertaken a regional review of their tending program to identify and address areas in need of improvement. Furthermore they have committed to researching factors affecting chemical efficacy. It is suggested that ARFMI incorporate all relevant data and findings into their operational policies to further reduce tending implementation issues.

Natural Regeneration

Planned targets for natural regeneration were overachieved by 25% (27,761 ha vs. 22,087 planned). Increased reliance on extensive renewal treatments was due in large part to budgetary constraints

In 2006-07 13,878 ha (314% of planned FMP) of backlog depleted area was declared as being naturally regenerated. The annual report for that period notes that some of the backlog dates back to 2001. The FMPM clearly states that '*renewal operations, which include natural regeneration initiated by harvest, and natural regeneration in natural disturbances, will normally be reported in the year in which the disturbance occurred' (E-8 ln 36-38).* Natural regeneration surveys were postponed for 2009. Recommendation 21 addresses monitoring shortfalls including the backlog of areas prescribed for natural assessment requiring assessment.

Areas declared as naturally regenerated under the clearcut silvicultural system were viewed and assessed to gauge their success in achieving the intent of the FOP and the direction of the FMP. Naturally regenerating aspen-leading stands showed adequate regeneration success, however limited aspen suckering was noted in areas were compaction and rutting had occurred (Sherring 15). Overall site impact was found to be minimal and not considered to be a contentious issue.

Natural regeneration of lowland peatland sites was found to be satisfactory through the successful application of careful logging systems. On lowland sites this system is used to protect advanced growth black spruce and is called Careful Logging Around Advanced Growth (CLAAG) or Harvesting with Regeneration Protection (HARP), depending on the pre-harvest forest condition. CLAAG and HARP are well suited to most of the lowland sites that dominate the area. Careful logging techniques are not as well suited to upland sites since many species of trees and shrubs are usually common and advanced regeneration typically includes undesirable species.

CLAAG areas were found to have sufficient advance regeneration within the leave strips while very little site impact was noted in the travel corridors. Areas designated as HARP were found to be consistent with the direction of the FMP. Larger sized trees (>10 cm dbh) were left in the leave strips, providing an ample seed source for regenerating the travel corridor. This was noted in Block Noseworthy 13.

Careful logging viewed on most upland sites was deemed to be ineffective. Little advanced growth was present to protect in some areas and shrubs now dominate. In other areas regeneration mainly consists of balsam fir, balsam poplar and birch – less desirable species than the spruce and aspen harvested. Considerable active renewal through chemical and/or mechanical site preparation, planting and tending will be needed to meet standards on some of these sites. Other sites will naturally renew to less desirable species. The 2010-12 CP SGRs no longer permit CLAAG on upland sites; however there is now a compliment of upland sites treated in this manner that will regenerate to poor quality stands unless remedial treatments are undertaken. Some sites will be too expensive to treat; however, the effort should be made to identify and treat those where it is practical to do so.

Recommendation 18: ARFMI must:

a) conduct an immediate review of all upland sites harvested under the CLAAG system since 2003 and implement remedial silvicultural treatments, where practical, on sites found not likely to become a silvicultural success
b) implement exceptions monitoring on all upland CLAAG sites for which the use of natural advance growth (without planting) as a regeneration method is deemed as not recommended under the Silvicultural Guide.

In addition, and as discussed previously with regards to careful logging on upland stands, increased presence of less desirable tree species such as balsam fir, balsam poplar, etc. is common with this practice. The main issue, and source of the audit team's concern, is that transition of significant amounts of area from forest units dominated by preferred tree species to those with less preferred tree species is a threat to forest sustainability.

Recommendation 19: ARFMI must address the increased presence on the Forest of less desirable tree species such as larch and balsam fir.

Renewal Support

Tree improvement activities, seedling production, cone collection and available seed inventory was examined during the audit. Orchard maintenance activities were the only tree improvement activities conducted during the audit period. Seed and planting stock production and seed inventory levels during the term were consistent with forecast levels in the FMP.

Access

Field examination of access development and maintenance included a sample of roads, water crossings and aggregate pits operated in the five-year period. As well, the sample included road construction and maintenance activities performed under the roads agreement for the management unit. All activities were found to have been performed in accordance with related requirements and consistent with the FMPs and AWS with the exception of aggregate pits.

Aggregate pits must be maintained in accordance with the respective Ontario standard. These standards ensure public safety, operational safety and visually sensitive rehabilitation. Examples were viewed where pit standards had not been met including lack of rehabilitation sloping and operating next to the tree line.

Recommendation 20: ARFMI must ensure that aggregate pits are operated in accordance with the relevant standard.

4.5 System Support

Ontario's forest management system is based upon timber revenues, which declined significantly during the audit term due to the sector collapse and broader global economic decline. Financial challenges faced by the SFL holders led to high rates of attrition and companies faced unprecedented demands to restructure. Given these circumstances, the professionalism of remaining staff prevented a complete collapse of the forest management system.

The audit team has some concerns about the adequacy of the system support in place during the term of the audit. System and staffing support issues where determined to be a primary contributor to the key audit finding relating to silviculture monitoring (see silviculture monitoring section). During the field audit it was evident that silvicultural records could not be readily located, raising concerns about the completeness of records transferred to the new manager. A review of some of the systems and issues associated with the challenges of the amalgamation is recommended in Section 4.1. See Recommendation 5.

FRMG, a newly formed company contracted by ARFMI to deliver forest management services on the Abitibi River Forest, is based upon the systems and personnel associated with Timiskaming Forest Alliance Inc., which has a proven management track record. Time will tell how well these new systems will work in the new environment. To assist in the transition, the audit team suggests that ARFMI continue its efforts to capture local experience and knowledge in the new management systems being developed by FRMG. As an example, several foresters, retired or operating as independent contractors, were retained by ARFMI to assist in field portions of the audit. This proved to be effective and efficient in facilitating the audit.

4.6 Monitoring

Silviculture

AbiBow's entire silviculture effectiveness monitoring (SEM) system was evaluated during the audit. The focus was on determining whether the system allowed for monitoring the effectiveness of all silvicultural treatments, identified areas in need of remedial actions and determined conformance of operations to the selected management alternative of the FMP.

Budgetary and staffing cut backs starting in 2006 severely affected the company's ability to monitor regenerating stands and effectively prescribe follow-up tending treatments. Natural regeneration assessments were postponed in 2009. Tending assessments performed during the term were done in an informal manner with no supporting documentation. Some blocks viewed during the audit fell short of the intended prescription due primarily to a lack of tending or fill planting. It was evident that a comprehensive and systematic monitoring system is needed to measure the efficacy of implemented silvicultural treatments and identify the need for follow up treatment in order to satisfy the direction and intent of the prescribed SGR.

Recommendation 21: ARFMI must address the backlog of area that requires assessment of natural regeneration.

Recommendation 22: ARFMI must ensure that sufficient system and staffing support is available to properly execute the SEM program

FTG assessment surveys where underachieved by 50% during the plan term with a total of 19,574 ha surveyed in 2005, 2006 and 2007. As indicated in the TAR, survey work on the IFF was curtailed in 2008-2010 due primarily to budgetary constraints.

Recommendation 23: ARFMI must address the backlog of FTG surveys on the former Iroquois Falls Forest.

FTG data shows that 98% (19,493 ha) of the areas surveyed are considered a regeneration success - meeting minimum stocking and species requirements but not the intended forest unit. Silvicultural success - meeting minimum stocking and species requirements as well as the desired forest unit – was achieved on 40% of the areas surveyed.

A key contributing factor to the low achievement of silvicultural success is the broad scale application of CLAAG harvesting techniques on upland sites leading to the retention of balsam fir, larch, aspen and birch advanced growth within the leave strips. See Recommendations 18 and 19.

Approximately 75% of the surveys were done on the ground using the well spaced free growing assessment methodology. The balance of the survey areas was conducted aerially due to access constraints. A representative sample of area declared successfully regenerated was viewed during the field audit and actual FTG calls were compared to field observations. Issues were noted with respect to the audited FTG survey areas including; stands not being properly delineated to reflect variances in species composition and stocking (Clifford 12, Block 277), species being misinterpreted (Challies 12: black spruce miscalled as white spruce) and the underestimation of larch (Clive 10). Observed discrepancies were determined to be due to the following:

- Surveyor inexperience and employee turnover within contractors
- Survey lines not being stratified based on the FRI and/or implemented renewal treatments.

In addition, FTG field tally sheets were compared for consistency with inventory information to check for data transfer errors; none were found.

District MNR implemented a comprehensive SEM program during the audit term. The 2005, 2006 and 2007 FTG submissions were assessed by MNR staff using intensive ground methods (2,776 ha, 14%) as well as aerial surveys (1,900 ha, 10%) to achieve their desired sample size (minimum of 10%). MNR assessment results were compared to company submissions and discrepancies and trends were clearly presented in SEM reports. Surveyed areas during the term were determined by MNR to be within generally acceptable variation of the company surveys with MNR stating; *"It is evident that the ground surveys performed by Abitibi are providing them with dependable information and does not have the variation seen with aerial survey method" 09-10 SEM.* MNR's SEM work during the audit term was determined to be excellent and is deemed a best practice. The audit also determined that MNR completed outstanding work with regards to compliance monitoring (see next section). This Best Practice has been developed to recognize both of these areas of excellence.

Best Practice 2: The monitoring of silviculture effectiveness and compliance by the Ministry of Natural Resources during the audit term was deemed to be excellent.

Compliance

AbiBow produced a strategic Compliance Plan for the Iroquois Fall Forest 2005-10 FMP. A strategic Compliance Plan was also developed for the 2010-12 CP of the amalgamated forests. These documents were approved well in advance of operations commencing. The compliance plans were well written and met all requirements including a description of compliance goals, priorities and strategies as well as reporting responsibilities.

Annual compliance plans were also produced by AbiBow for each AWS during the audit term; each notes compliance priorities, etc. and lists all operations by block number. The block lists include values by AOC code, forecast start date by season, company responsible, priority and complexity of planned operations, the need for 'in progress' reports and information regarding timing of startup notifications and completion reports. The spreadsheet was also noted to be used by AbiBow to track actual start-up dates, FOIP report numbers/dates.

MNR completed an Annual Compliance Operating Plan (ACOP) for each year during the audit term. The ACOPs reviewed were well written and included a comprehensive forestry section that discussed goals and compliance priorities. AWS planned compliance activities were prioritized through a ranking system developed by MNR.

The ACOPs are to be reviewed quarterly by MNR to determine progress. Some of the reviews are informally done and are not documented but more formal reviews are done at least twice a year, including a six-month and year-end summary. District Compliance Advisory Team meeting minutes capture the six month review notes while a year-end summary is produced to describe actual compliance activities that took place.

MNR also has a "Compliance-at-a-Glance" worksheet that links start-up notifications with monitoring targets by block. The worksheet is also used to keep track of inspection status and issues. This is deemed a very good resource for the inspectors.

Review and dispersal of compliance information is completed through two forums:

- District MNR compliance staff meets quarterly as the Forest Advisory Team.
- Joint industry/MNR compliance meetings occur as needed

These forums provide for necessary dissemination of information and discussion regarding compliance.

In addition, an inter-district protocol was developed to define the roles and responsibilities of the three MNR districts that service the Abitibi River Forest. The protocol was well conceived and pertinent portions regarding MNR roles/responsibilities should be brought into the next Abitibi River Forest FMP to provide clarity and connectivity between these documents.

Company compliance reports viewed were generally timely and included required text regarding observations and pictures/scanned maps, etc. were normally included in company reports as needed. MNR reports viewed were comprehensive and included digital pictures and scanned maps as necessary to aid in discussing inspection findings.

On-the-ground joint inspections rarely occurred during the audit term. While the joint office meetings provide a good forum for discussing compliance, joint on-the-ground meetings are most effective for discussing actual operational issues. MNR has also determined that joint inspections should be encouraged and has listed this as an area in need of improvement in the ACOPs.

Industry and MNR inspectors completed 618 inspections during the audit term; industry completed 495 and MNR 123. The number of inspections completed was determined to be satisfactory based on the reduced level of activity during the audit term. MNR's rate of identifying non-compliance was significantly higher than the company rate (11% vs 5% for actual non-compliant activities). Through a review of reports and interviews with MNR and industry staff it was determined that company inspectors tend to use 'in compliance with comments' more than MNR and this may be one reason there is a large discrepancy in reported compliance status.

Recent changes to the compliance program remove the requirement for the industry or MNR inspector to make a specific determination of compliance versus non-compliance and instead focus on operational issues found. How these issues are managed will determine the compliance outcome. The changes made to the compliance program will reduce/eliminate the variability in reporting of compliance. Almost all of the non-compliant operations found during the term were classed as minor, one was classed as moderate and a few warning letters and penalties occurred.

Cochrane District MNR has allowed the submission of French reports and has a good process in place to ensure their proper review. Although this process has worked to date, MNR should consider the recent changes in the FOIP program to ensure all important findings are translated into English; optimally this would be done on the same inspection report.

When operations were suspended during the audit term for a period greater than 20 working days, suspended operation reports were completed but the duration of many suspensions and the content of suspension reports was found to be an issue. According to FOIP as of early October 2010 there are 69 suspended reports; based on direction in the April 1, 2008 Compliance Handbook, 52 reports over two years old are overdue, 31 of which date from 2006 or earlier.

The tardiest report, from August 2004, notes that "*There are areas that are yet to be harvested within this block. These areas are scheduled to be harvested during March/05, which have been identified as* *frost harvest opportunities off of gravel road."* A number of reports also note that harvest operations are suspended until frozen conditions permit operations to continue.

The most important issue with the 'extended' suspension reports is the significant delay of required silviculture treatments that may have occurred while awaiting completion of harvesting, hauling or other operations. The overdue suspension reports discussed above need to be dealt with appropriately to determine the renewal status of these blocks and identify any required treatments.

Recommendation 24: MNR must conduct spot checks on the outstanding suspension reports and determine any compliance action to be taken.

According to records and interviews AbiBow delivered an effective prevention/education program during the audit term. The company program is based on the ISO 14001 and SFI certification framework, which have rigorous requirements regarding developing, delivering and documenting prevention and education programs. AbiBow undertakes at a minimum a yearly indoctrination with all of the Overlapping Licensees operating on the Iroquois Falls Forest. These indoctrinations include ISO 14001 and CSA-Z809 awareness, contents of the approved AWS, standard operating procedures, explanations of operating blocks and the contents of the annual compliance plan. AbiBow staff was found to be well trained.

MNR also delivered an effective prevention/education program for staff during the audit term. Staff is well trained and effectively completed required tasks. The thorough, well-conceived compliance monitoring protocols put in place and being implemented by MNR demonstrates the competence of the staff.

Annual Reports

Annual reporting during the audit term was fairly well done. The ARs were generally well written, numbers in text and tables were typically in agreement and 'to date' summaries were usually correct; however there were some variances between text and tables. The variances were small and not considered significant.

The ARs for the three years 2005-06 to 2007-08 showed silvicultural success rates of approximately 40%. No regeneration surveys were conducted in 2008-09 and data was not available for the final year of the plan. In the FMP, based on the intensity and silviculture treatments planned, multiple pathways are available and modelled to allow current forest units to become a number of future forest units. In Tables AR-13 and 14 only a one-to-one relationship is reported. Thus, in the audit team's view, there is an issue with the use of multiple-pathway modelling for the FMP and single-pathway reporting in these AR tables. This discrepancy will lead to a breakdown in the adaptive management cycle since results being tabled in ARs cannot inform the planning team for the next FMP. In addition, low silviculture success ratios currently derived by the reporting format may send the wrong signals to policy makers and the general public.

Recommendation 25: Corporate MNR must review the reporting procedures and consider modifying them to recognize multiple successional pathways to improve the adaptive management process.

4.7 Achievement of Management Objectives and Sustainability

Trend Analysis Report

FRMG prepared the Trend Analysis Report (TAR) for the IFF. The audit team reviewed the report and noted some deficiencies; FRMG submitted a revised report. Total productive forest area in Table AR-11 remained incorrect in the revised report for 1990-95 and 1995-00 however the audit team was able to derive the correct totals. Otherwise the TAR generally met IFAPP requirements. The TAR covered the years 1990-91 to 2008-09.

The TAR author notes that it is difficult to establish trends because of changes in forest units (FUs) between the various plan terms. While historically more conifer-based FUs were utilized vs. hardwood that trend is changing due to increased utilization of hardwood for OSB. There was variation between terms for planned harvest area. For the 1990-95, 1995-00 and 2000-05 FMPs actual depletions ranged from 101% to 74% of planned. Some of the reductions were related to disputes (labour, First Nations). For the 2005-10 FMP actual harvest was 65.6% of planned (4 of 5 years data) with an underharvest across all FUs due to poor markets. Harvest volumes for conifer ranged from approximately 80% to 93% while hardwood volumes ranged from 55% to 88%. Adjustments were made in volume estimates for the 2005-00 FMP to reflect higher than planned yields for both conifer and hardwood.

Trends in renewal treatments reflect a shift over time from more intensive renewal treatments to a greater reliance since 1995 on lower cost natural regeneration. Renewal shortfalls were tied to harvest shortfalls and tending levels have varied from below planned levels in two terms and above planned levels in two terms. Regeneration has kept pace with harvesting levels and regeneration success rates exceeded 90% in all terms. The TAR author found that changing forest descriptors over time (e.g. working groups to forest units and subsequent changes to forest units) do not allow establishment of clear trends. Overall, the productive forest landbase has declined slightly.

With respect to the achievement of management objectives for the 2005-10 FMP the TAR author found that Forest Diversity objectives were met during modelling for the 2005-10 plan (e.g. FU areas remained within the bounds of natural variation) and Forest Cover Indicator objectives were similarly met during modelling. Achievement of the Social and Economic objectives was negatively affected by economic conditions with annualized harvest volumes for spruce, pine and fir falling 24% short of target and white birch being 74% below target after four years of plan implementation. The annualized poplar volume target was met. Achievement of some Silviculture objectives was also affected by the industry downturn, specifically revenues to the Forest Renewal Trust were less due to reduced harvesting levels and there was a reduction in the level of silviculture work as a consequence. Barren and scattered area increased somewhat as a result. The TAR author believes these market-related challenges that are impacting harvest volumes and the silviculture program are temporary. All Forest Diversity Indicators met minimum targets during planning. For objectives related to Multiple Benefits to Society there was no significant reduction in managed Crown forest available for timber production. Only two thirds of the available harvest area was utilized in the first four years of the plan term. Once again, the shortfall is attributable to market conditions.

The TAR author concluded that "Based on the level of objective achievement ... and the current status of the 2005 independent forest audit action plan, it is concluded that the implementation of planned operations has provided for the long-term sustainability of the Crown forest." The TAR author offered the following in support of that conclusion:

- Most objectives were within or moving towards desired levels for indicators and that all forest diversity objectives were generally within acceptable ranges.
- Socio-economic indicators for wood supply currently were not at the desired levels; however, the long term trend suggests increased demand for wood products.
- The Silviculture objective of ensuring renewal revenues exceed expenditures was not achieved due to economic downturn, therefore Trust Fund balance is below minimum balance level but there was an agreement reached between AbiBow, Tembec and MNR going forward on amalgamated forest that will ensure adequate funding is available.
- All forest diversity indicators are at acceptable levels and all wildlife habitat levels remained above target levels.
- The majority of actions related to recommendations arising from the 2005 IFA were either completed or started and classified as ongoing.

Achievement of Management Objectives

Of the 24 objectives set in the 2005-10 FMP the audit team considers 18 to be fully met, four partially met and two not met. The objectives that were not met dealt with the silviculture program and slash management. Among the silvicultural issues were targets not met and the minimum balance in the Forest Renewal Trust was not being maintained in three of the five years during the audit term. The actual amount of area of slash piling fell far short of the area committed to. The issue of slash occupying productive forest land contributed to the partial achievement of two other objectives. A complete list of objectives and the audit team's assessment of their achievement is contained in Appendix 2.

Forest Sustainability

On balance, and despite the ongoing issue of slash management, forest sustainability (i.e. achieving plan objectives and the long term management direction set for the forest in the FMP) is being achieved. Habitat is being maintained at planned levels, habitat needs for species at risk are being addressed, and non-timber values are protected. Compliance to legal requirements is being met. The economic slowdown in the forest industry and the consequent reduced harvesting level has had a negative financial impact, although this situation is likely cyclic and expected to improve. Overall regeneration is keeping pace with harvest levels. The application of CLAAG on upland sites is, however, contributing to an increase in less desirable trees species on upland sites. Both MNR and AbiBow have worked proactively with area Aboriginal communities to build relationships and identify opportunities for Aboriginals to benefit from forestry activities. The public continues to be involved, in particular through the work of the Local Citizens Committees.

4.8 Contractual Obligations

All contractual obligations arising from the SFL were fully met with the exception of the following:

- Payment of Forestry Futures and Ontario Crown charges (partially met)
- Audit action plan and status report (partially met)
- Payment of forest renewal charges (partially met)
- Forest Renewal Trust account minimum balance (partially met)
- Forest renewal charge analysis (partially met)
- Compliance inspections and reporting (partially met)
- Silviculture assessment and standards program (not met)

The achievement of contractual obligations is summarized in Appendix 3.

Recommendation 26: The Cochrane District Manager must ensure that the submission timeline for the IFA Audit Action Plan Status Report is met.

There were eight recommendations arising from the 2005 IFA. In the opinion of the audit team five were met and three were partially met, as discussed in Table 2, below.

Table 2. Recommendations from the 2005 IFA not satisfactorily or fully addressed.

Recommendation	Audit Team Assessment
2 Abitibi should establish a measurable target and a schedule for slash reduction over the next five years.	Unmanaged slash continues to be an issue
3 Abitibi must take immediate action to address the existing backlog in regeneration surveys (free-to-grow) on the Forest.	Approximately 50% of planned FTG surveys were completed
5 OMNR and industry should review their FOIP reporting performance and	There is a significant backlog of suspended FOIP reports

Recommendation	Audit Team Assessment
examine ways to meet reporting requirements.	

4.9 Conclusions and Licence Extension Recommendation

There are three areas of concern arising from the audit that are considered key since they highlight the need to significantly alter certain current practices on the Forest in the interest of sustainability. The first area of concern arises from the lack of clear direction from the Province that has allowed forest operations to leave significant amounts of waste wood fibre (slash) at roadside where it occupies productive forest land and prevents establishment of regeneration. This practice is not unique to the IFF or the amalgamated Abitibi River Forest; management of waste wood fibre (both slash and chipper debris) has been a recurring issue for years as evidenced by the many recommendations made in previous IFAs across Ontario. Only a change at the Provincial policy level, supported by forest management plan commitments and enforcement of such commitments through the Provincial compliance program is likely to lead to an effective, permanent solution. The second area of concern is associated with implementation of harvesting patterns that protect existing regeneration on upland sites. This practice is leading to degrading of future stand composition through retention of less desirable species that will form a higher component of the new stand, and reduced productivity due to the inherently higher levels of competition on upland sites resulting in lower stocking levels. A third related area of concern is the retention of mature larch seed trees in harvest blocks which is also contributing to a significant increase in the larch component on lowland sites as well.

The audit team concludes that management of the Iroquois Falls Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Abitibi-Consolidated Company of Canada. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol.

No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc. for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.

Appendix 1 – Recommendations

Independent forest Audit – Record of Finding

Recommendation 1

Principle: 2. Public Consultation and Aboriginal Involvement

Criterion: 2.1 Local Citizens Committee (LCC)

Procedure: Assess establishment of the LCC. This will involve a review of the terms of reference and LCC minutes, compared to the applicable FMPM requirements.

Background Information and Summary of Evidence:
The 2004 FMPM requires that the LCC Terms of Reference be prepared (or updated for an existing committee) at the beginning of Phase I planning. The Cochrane LCC Official Terms of Reference (updated in March 2006, March 2007, March 2008 and January of 2009) was reviewed. Section 3.2.4 of the 2004 FMPM lists content requirements for the Terms of Reference for the LCC. The following items were either not included or not adequately addressed in the Terms of Reference for this audit period:

- Item (a) – the name of each committee member and his/her affiliation
- Item (b) – the date of each member's appointment to the committee
- Item (c) – the roles and responsibilities of the committee, and individual committee members, including how each committee member will report back to and/or obtain input from the constituency he or she represents
- Item (i) – background material and training required to assist committee members with their roles and responsibilities and forest management planning matters

Discussion:
The LCC terms of reference form part of the public record. It should be an accurate snapshot of the committee at the time it is updated and meet the requirements of the FMPM. Much of the content required by the FMPM also serves to aid the committee members in fulfilling their roles and responsibilities to the committee, particularly for new members.

Conclusion:
The LCC Terms of Reference do not currently meet the content requirements of the FMPM.

Recommendation 1: MNR must ensure that the LCC Terms of Reference are updated to meet the content requirements of the FMPM.

Independent Forest Audit – Record of Finding

Recommendation 2

Principle: 2. Public Consultation and Aboriginal Involvement

Criterion: 2.2 FMP Standard Public Consultation Process

Procedure: 1. Review and assess whether the public consultation processes for the plan and any amendments met the requirements of the applicable FMPM and whether the process was effective.

Background Information and Summary of Evidence:
Amendment #10 (minor) covered planning for road construction; decommissioning and abandonment of Perch Lake Road, road name changes and removal of a caribou calving area. Public notices were placed in four English and two French language newspapers and Wawatay News, an Aboriginal publication. The planned insertion date was August 6, 2008; however the actual insertion dates were August 7 for the Iroquois Falls *The Enterprise* and the *Cochrane Times,* and August 8 for the French language *Cochrane Times-Post*. The ad stated that the 15 day inspection period started August 6 and ended Aug 21; therefore the stated inspection period was not provided for the papers noted.

Discussion:
The FMPM defines the process for issuance of public notices, including the length of the public inspection period

Conclusion:
The timing of placement of public notices for Amendment #10 did not allow for the minimum 15 day inspection period.

Recommendation 2: MNR must ensure that public notices are placed to allow the required public inspection periods to be met.

Independent Forest Audit – Record of Finding

Recommendation 3

Principle: 2. Public Consultation and Aboriginal Involvement

Criterion: 2.2 FMP Standard Public Consultation Process

Procedure: 1. Review and assess whether the public consultation processes for the plan and any amendments met the requirements of the applicable FMPM and whether the process was effective.

Background Information and Summary of Evidence:
As part of the public notice for Amendment #10 letters were sent to persons and organizations on the District mailing list including area First Nations and Aboriginal organizations. The public notice letters were missing information required by the 2004 FMPM. Public notice letters did not contain the following required information:

> "In addition to the public notice content requirements described in Part C, Section 6.1.1, the notice will contain:
> (b) a statement that further public consultation may be required if concerns are raised;
> (c) a statement that the minor amendment will receive final MNR approval by a specified date if no concerns are raised;
> (d) a brief explanation of how comments which are received will be handled under relevant provisions of the *Freedom of Information and Protection of Privacy Act*; and
> (e) a statement of the opportunities for resolution of issues (Part C, Section 6.1.4).

Discussion:
The FMPM defines the minimum content requirements for public notice letters to ensure consistency and completeness.

Conclusion:
MNR did not fully meet the content requirements for the public notice letters associated with Amendment #10.

Recommendation 3: MNR must ensure that public notices letters contain all the content required by the FMPM.

Independent Forest Audit – Record of Finding

Recommendation 4

Principle: 3. Forest Management Planning

Criterion: 3.1.2 Planning Team and Advisory Groups

Procedure: Assess the effectiveness of the Planning Team and advisory groups

Background Information and Summary of Evidence:
A review of the 2010-12 CP and Supplementary Documentation, interviews and questionnaires determined that FMPM procedures were followed but the Planning Team encountered delays in meeting some checkpoints (i.e. planning inventory and base model) early in the planning process for the 2010-20 FMP. These delays and concern over the implementation of the pending Caribou Conservation Plan under the Endangered Species Act (2007) led to a determination by the Steering Committee that a Contingency Plan would be required.

Discussion:
The reasons for going to a Contingency Plan were properly documented in the Contingency Plan proposal; however, the Steering Committee only met twice, contrary to the Terms of Reference which called for quarterly meetings. No minutes were recorded for those meetings. There is a need to improve communication between the Planning Team and Steering Committee in future planning efforts. For example, two planning team members were not certain why a contingency plan had been called for late in the planning process

Conclusion:
The Steering Committee plays an important role in the planning process and minutes of meetings and correspondence should be maintained and included in the Supplementary Documentation section of the FMP. The audit team believes that there is a need to improve communication between the Planning Team and Steering Committee in future planning efforts.

Recommendation 4: MNR must ensure that the Steering Committee meets as required during the development of the 2012-22 FMP and that minutes for those meetings are recorded, distributed to planning team members and included in the FMP supplementary documentation.

Independent Forest Audit – Record of Finding

Recommendation 5

Principle: 3. Forest Management Planning

Criterion: 3.3 Management Unit Description

Procedures: 3.3.3.1 – 3.3.5.1 The IFAPP devotes eight criteria and 13 procedures to the assessment of the management unit description section in an FMP.

Background Information and Summary of Evidence:
The CP was prepared consistent with the approved Proposal's table of contents that excluded the forest management unit description section. The FMPM states "*A Contingency Plan is an interim forest management plan that is required when special circumstances affect the implementation of a forest management plan*". The 2010-12 CP does not contain a forest management unit description section.

Questions emerge from this amalgamation that deserve further consideration. For example, since all of the forests had data that met the Forest Information Manual (FIM) requirements, why did it take such a lengthy period of time to develop the planning inventory? Are there problems with FIM or were there inadequate resources to bring the inventory together? Why does the MOE and MNR not consider a forest description for a new forest to be important in a Contingency Plan? Are there redundancies in the planning manual describing the required content of a management plan?

Discussion:
A new forest created through amalgamation should have an interim forest management plan that actually describes the new forest. Although the current condition section of the CP and supporting documentation describe many important elements of the Forest, this is a function of some redundancies in the FMPMs (1996-2004) and does not explain why an important context setting section of the CP was not seen as being necessary by those proposing and approving the Contingency Plan proposal.

The plan under development for 2012 is already considering a Contingency Plan requirement for its first year of operation. No doubt the plan will have the required forest management unit description section. But these irregularities arising from a complex amalgamation of several forests creates problems that will be encountered on a grand scale if the proposed tenure and pricing reforms lead to large amalgamations across the Province. In addition to planning issues, amalgamations have other issues such as how LCCs are formed, how roles are distributed among District offices and how "trends analyses" are interpreted.

In addition, the reasons for a Contingency Plan, such as the delays in planning inventory approval, deserve review. Assuming all forests met FIM criteria, the audit team questions why there were problems in combing data sets. These questions merit attention by Corporate MNR to ensure the planning support system is functioning properly.

Conclusion:
The unusual circumstances surrounding the 2010-12 CP deserves further review and a report on lessons learned to better inform future amalgamations.

Recommendation 5: Corporate MNR, in consultation with the Ministry of Environment, must investigate and report upon lessons learned in the amalgamation and associated planning challenges encountered in the creation of the Abitibi River Forest to ensure information management systems and other procedures are adequate to deal with future amalgamations.

Independent Forest Audit – Record of Finding

Recommendation 6

Principle: 3. Forest Management Planning

Criterion: 3.4.1.4 FMP achievement of the Checkpoint *Support for Proposed Management Strategy*

Procedure: 1. Assess progress towards achievement of the checkpoint by reviewing the results of the desired forest and benefits process

Background Information and Summary of Evidence: The Abitibi River Forest is an example of a forest operating at a scale more consistent with the Forest Management Guide for Boreal Landscapes. Such a scale should allow for better solutions to landscape-level issues. However, the reporting of various forest cover indicators at this large scale may come at the expense of localized issues such as representation of certain forest cover types within some management sub-unit locations.

Discussion:
Other models like Patchworks allow these trade-offs to be more transparent at different scales of resolution compared to SFMM. Patchworks was used to help explore these trade-offs during the development of the Forest Management Guide for Boreal Landscapes. This guide is soon to be released and will be used in the development of 2012 forest management plans

Conclusion:
Given the pressure on wood supply and non timber values, the preparation of forest management plans on amalgamated forests would benefit from a more careful analysis of trade-offs at different scales using additional decision support tools such as Patchworks.

Recommendation 6: Corporate MNR must consider requiring that trade-off analysis be conducted using an appropriate decision support tool on amalgamated forests.

Independent Forest Audit – Record of Finding

Best Practice 1

Principle: 3. Forest Management Planning

Criterion: 3.4 Proposed Long-Term Management Direction

Procedure: Assess achievement of the checkpoint for portions of the FMP relevant to habitat classifications

Background Information and Summary of Evidence:
The 2010-12 CP provides considerable discussion about woodland caribou. The LTMD with respect to caribou is comprehensive and is supported by Supp Doc 4. Caribou Strategy (Forest Dwelling Woodland Caribou Protection In the Cochrane Area Forest). The LTMD focuses on caribou in four sections: 3.2.3.6 Historic Caribou Habitat; 3.2.3.7 Caribou Habitat Description; 3.2.3.9 Spatial Caribou Habitat; and, 3.2.3.10 Marten, Caribou and Marten/Caribou Core Areas.

The primary data source for spatial decisions related to caribou was the ongoing multi-partner research initiative established to study woodland caribou habitat and range use. The study was initiated in 1998 and involves collaring caribou cows with GPS radio-collars that track animal movement which, when plotted with habitat, roads or other landscape features, help to gain understanding of caribou response to management decisions and strategies.

Discussion:
The caribou study has contributed significantly to knowledge of caribou movement and range use in the area. Knowledge gained from this study has contributed to FMPs including 2010-12 CP. The intent is to collar another 30 caribou bringing the number to 50 and to collar more wolves to bring the number to 36 in six to eight packs.

Conclusion:
The knowledge base provided by this study is invaluable for integrating caribou habitat and range needs with forest management planning.

Best Practice 1: The ongoing multi-partner woodland caribou study is an excellent example of applied research that has provided and continues to provide significant science-based contributions to forest management planning.

Independent Forest Audit – Record of Finding

Recommendation 7

Principle: 3. Forest Management Planning

Criterion: 3.5.5 FMP harvest and natural depletions

Procedure: Review the applicable FMPM requirements related to planned clearcuts, including planned clearcuts that exceed 260 ha, and assess whether

- there is appropriate silvicultural or biological rationale for planned clearcuts that exceed 260 ha

Background Information and Summary of Evidence:
A listing of planned clear cuts >260ha and specific biological or silvicultural rationale for these larger planned cuts is to be provided in Table FMP-16. In the 2010-12 CP in many cases there is no rationale for the planned cuts and often the text has been truncated (possibly a result of formatting into pdf). For example, the following rationale is provided for Block 300 (note the truncated final sentence): "*The planned harvest block is located in the Marceau area of the TBS sub-unit. The block is composed of mostly lowland black spruce areas and includes a large amount of forecast depletion area which will not be cut before April 1, 2010. Both the NDPEG in*".

Discussion:
The 2009 FMPM still requires biological or silvicultural rationale be provided for planned cuts >260ha.

Conclusion:
The following recommendation is made to ensure the next plan meets the requirements.

Recommendation 7: ARFMI must ensure that the next FMP contains biological or silvicultural rationale for planned clear cuts greater than 260 ha.

Independent Forest Audit – Record of Finding

Recommendation 8

Principle: 3. Forest Management Planning

Criterion: 3.5.1 FMP areas selected for operations

Procedure: 3.5.1.1 Review areas selected for operations and assess whether

- the FMP selects areas for harvest, consistent with the AHA by forest unit and the selection criteria

Background Information and Summary of Evidence:
Planned harvest in the 2010-12 CP for the Abitibi River Forest closely mirrors the projected/forecast harvest area - about 38,000 ha is planned for harvest over the two-year term. About 9,000 ha of the allocation (~24%) is in younger aged stands than modelled. This is considered a significant level of age class substitution.

The age class substitution is rationalized in the CP as necessary due to re-allocating stands not harvested in the previous plans (mainly the 2005-10 Iroquois Falls FMP), focusing allocations away from contentious areas (including all stands in the caribou zone) and for operational and access considerations. The substitution is further rationalized – "*the younger for older age class substitutions for the planned harvest area are not expected to impact the long term sustainability as future harvesting during the 2010-20 term will be expected to move to these older areas as much as possible*".

Largely due to the age class substitution, the selected allocation is predicted to provide considerably more volume than modelled. The volume for the two years should be about 2.6M m3 conifer and 1.0M m3 hardwood but planned harvest is 3.7M m3 conifer and 1.3M m3 hardwood - an extra 1.1M m3 of conifer (+30%) and 300k m3 of hardwood (+24%) over the two years. Reasoning given is limitations to operating areas to avoid caribou habitat, to utilize accessible areas and to avoid contentious areas. Also, "*With the allocations being kept out of the lower productivity areas of caribou habitat in the more northerly sections of the unit, this meant that allocations were forced to the more productive areas of the forest*".

Discussion:
As described in the 2010-12 CP this imbalance could be re-aligned over the remaining eight years of the planned 2010-20 FMP but according to interviews with MNR staff and documentation, the plan for the Abitibi River Forest has changed. Instead of completing a plan for the term 2010-20, which was to include the planned harvest in the 2010-12 CP as the first two years of the ten year allocation, the new plan is to produce a 2012-22 FMP. This will not allow re-alignment of the allocation and may provide for additional age class substitution into younger stands. Further, there will be no practical way of determining the effect of the imbalance during the two-year stand-alone CP.

Conclusion:
Due to the severe downturn in the forestry sector it is unlikely that the full planned harvest will be realized, so there are no real concerns regarding sustainability and no need to amend the 2010-12 CP. However, there is concern regarding public disclosure and accountability as well as further age class substitution should the new FMP be fully detached from the 2010-12 CP.

Recommendation 8: ARFMI must consider the harvest profile selected in the 2010-12 CP when developing the profile for the next FMP so that further substitution into younger age classes does not occur.

Independent Forest Audit – Record of Finding

Recommendation 9

Principle: 3. Forest Management Planning

Criterion: 3.5.5 FMP harvest and natural depletions

Procedure: 3.5.5.1 Assess planned implementation of the management strategy by reviewing

- the projected, forecast and planned harvest (including fuelwood) and natural depletions in relation to the applicable FMP planning requirements including residual stand structure and comparison to the management strategy

Background Information and Summary of Evidence:
The 2010-12 CP contains an excellent section describing utilization direction to be used during operations. The direction was adapted from the Northeast Region Operations Guide for Marketability Issues (Apr. 2008). The Operations Guide was developed over several years by an MNR Regional group aided by several scientific advisors and industry representatives as a result of ongoing and forecast utilization issues in the Region. The Guide was developed mainly to provide direction regarding natural renewal of hardwoods following partial harvest but also provides direction for renewal to conifer.

The Northeast Guide allows for the retention of up to 30% of standing trees in cutovers (equated to approximately 70 trees per hectare). This value was selected based on provision of adequate openings for natural renewal of hardwood tree species. The Guide also allows for felling and leaving up to 100 trees per hectare reasonably distributed on site and bringing an unidentified number of additional unmarketable trees to roadside to reduce renewal interference and provide possible future fibre for emerging markets. When renewing conifer, no more than 25-50 residual trees are to be left standing per hectare after harvest. Specific renewal stocking limits are also provided:

- Site occupancy cannot be reduced to less than 90%
- Density of well-spaced, free-growing trees cannot be reduced below 1,000 conifer stems per hectare or 1,500 hardwood stems per hectare (further identified as effective density of >7,000 randomly distributed aspen stems per hectare).

The Guide also includes a requirement to develop a prescription/action plan to ensure silvicultural success and adherence to accepted practices in stands harvested using the Guide. Appendices also include deferral strategies as well as a sample operational decision key.

Discussion:
The Northeast Guide is considered a thoughtful resource for use by forest management planners but based on auditor experiences in the forest sector (no operations occurred during the audit term so field review was not possible) there are potential issues. First, Ontario's FRI Photo Interpretation Specifications and the Forest Information Manual (2009) Technical Specifications for FRI note that stands with low stocking (traditionally deemed 'barren and scattered') have a crown closure of less than 25%. Therefore a 30% residual canopy following harvest will still form a stand in the next FRI regardless of silviculture performed and the stand will be classified as a low-stocked, high-graded stand. Second, there is no formal requirement to complete pre-harvest ground verification of forested conditions (one tactical consideration in the Guide is to "*consider field verification*"). The current inventory is often not precise enough to determine the required volume split, ground data or additional information is needed. In addition, the allowance for bringing unmarketable trees to roadside should be clarified. Loss of productive area along roadways to unmarketable trees should be minimized.

Conclusion:
The Northeast Guide residual canopy allowance should be aligned with FIM and Ontario's FRI Photo Interpretation Specifications to ensure consistency. Regarding the need for ground data or additional information – the utilization standards have fairly specific criteria that may not be met with the current inventory, which is based on interpretation of 1:20,000 scale black and white imagery. The auditors believe that ground surveying and/or utilization of the newer digital imagery for the Province would provide the additional information required to make informed management decisions for selected stands/blocks. Waste wood fibre management has been a concern of this audit and previous audits for this Forest. To ensure minimization of loss of productive land through bringing

unmarketable trees to roadside, the Northeast Guide should clarify the expectations of this practice (e.g. only done within economic radius of end use facility, material piled and burned if not used within two years, etc.).
The following recommendation is made to strengthen the Guide in these respects.

Recommendation 9: MNR Region must update the *Northeast Region Operations Guide for Marketability Issues* document as follows:

- reduce the allowance for residual standing trees to no more than 25% canopy closure to better align the Guide with inventory standards
- incorporate a requirement to provide information, in addition to the current FRI description, to confirm actual stand conditions prior to finalizing operational plans
- clarify the allowance for bringing unmarketable trees to roadside in order to minimize the loss of productive area along roadways

Independent Forest Audit – Record of Finding

Recommendation 10

Principle: 3. Forest Management Planning

Criterion: 3.5.5 FMP harvest and natural depletions

Procedure: 3.5.5.1 Assess planned implementation of the management strategy by reviewing

- the projected, forecast and planned harvest (including fuelwood) and natural depletions in relation to the applicable FMP planning requirements including residual stand structure and comparison to the management strategy

Background Information and Summary of Evidence:
The Northeast Region Operations Guide for Marketability Issues was modified for use in the 2010-12 CP. In particular, allowance was provided to leave up to 70 residual standing trees on all sites. The 2010-12 CP pg. 180 states: "***Artificial Regeneration*** *- The following conditions apply to intolerant hardwood forest types where artificial regeneration for the establishment of conifer is proposed:*

- ***Trees Left Standing in the Cutover:*** *After the final harvest, no more than 70 trees per hectare are to be left standing as residual or wildlife trees or the site should be chemical site prepared."*

Discussion:
The Guide direction is to leave no more than 25-50 residual standing trees when conifer is planned so that proper silviculture treatment may occur.

Conclusion:
Allowing up to 70 trees is a considerable departure from the Guide direction and no rationale was provided for this in the FMP. Considering the Guide is the local resource used to aid in keeping utilization standards compliant with the Scaling Manual, the Guide direction should have been closely adhered to.

Recommendation 10: ARFMI must amend the utilization standards in the 2010-12 CP to be consistent with the Northeast Region Operations Guide for Marketability Issues document or provide compelling rationale for the significant deviation from that direction document. The 2012-22 FMP utilization standards should also conform to the Guide direction or provide rationale for departure.

Independent Forest Audit – Record of Finding

Recommendation 11

Principle: 3. Forest Management Planning

Criterion: 3.5.12 Determination of Sustainability

Procedure: Assess whether the FMP provides for the sustainability of the Crown forest on the management unit based on the collective achievement of the objectives, comparison of proposed operations to the LTMD and the associated rationale for any management objectives that are not achieving the desired levels.

Background Information and Summary of Evidence:
Section 3.7.7 of the analysis package for the 2010-12 CP includes specifics regarding planned conversion of harvested area to non-forest area based on an analysis by Tembec. The associated strategy links slash management to renewal intensity.

The slash analysis used for developing the corresponding 2010-12 CP model input included mapping of slash cover and calculating land lost by treatment type. No conversion was modelled after 30 years as all roads were assumed to be in place and slash disposal methods (e.g. biomass utilization) were expected to reduce slash losses to 0%.

Discussion:
Considering minimal on-the-ground improvement has occurred in slash management over the past 30 years and much of the Forest is very remote, the audit team believes the model assumption of no slash losses after 30 years is overly optimistic.

Conclusion:
Modelling for forest management plans needs to reflect on-the-ground results as closely as possible. In the absence of firm Provincial policy and considering the remoteness of much of the Forest, modelling for zero loss of productive land to slash after 30 years is not realistic. This should be remedied in the next FMP.

Recommendation 11: The Abitibi River Forest planning team must consider on-the-ground results, current Provincial direction and the remote nature of a large portion of the Forest when modelling for productive land loss due to waste wood fibre in the 2012-22 FMP.

Independent Forest Audit – Record of Finding

Recommendation 12

Principle: 3. Forest Management Planning

Criterion: 3.5.12 Determination of Sustainability

Procedure: Assess whether the FMP provides for the sustainability of the Crown forest on the management unit based on the collective achievement of the objectives, comparison of proposed operations to the LTMD and the associated rationale for any management objectives that are not achieving the desired levels.

Background Information and Summary of Evidence:
Section 3.7.7 of the analysis package for the 2010-12 CP includes specifics regarding planned conversion of harvested area to non-forest area based on an analysis by Tembec. The associated strategy links slash management to renewal intensity.

Using the CP allocated harvest area and the plan's estimates of slash coverage by silvicultural intensity, the audit team calculated that about 470 ha of productive land would be lost annually under slash (4,700 ha of productive Crown land lost or severely delayed for regeneration over the ten year term of an FMP). To the audit team this represents a significant potential loss of productive forest land. However, the issue is not confined to the Abitibi River Forest.

Discussion:
Accumulating waste fibre along roadways following harvesting operations is directly associated with mechanized full tree to road-side logging operations. With this process most unmerchantable material (i.e. slash) is laid down in long corridors next to the roadbed, often on both sides. Depending on tree size, marketability factors, etc. a considerable amount of waste fibre can accumulate along roadbeds. Accumulated waste wood fibre, particularly from conifer trees, is known to break down very slowly and create a physical impediment to new tree growth and chemically alter soil so that few plant species can grow under and around the slash.

To illustrate the duration and extent of the issue Provincially, the audit team conducted an analysis of IFA recommendations related to slash management. The analysis, covering the 1996-2008 period, found that recommendations were made in every year (average 5.5/year) and that the vast majority of recommendations (69) were directed at the Management Unit/District level while only three were directed at the Provincial (e.g. policy) level. Thirty seven of the recommendations were made in the Northeast Region, 33 in the Northwest Region and two in the Southern Region. While action plans have been developed to address IFA recommendations these have not always translated into reduced slash on the ground.

It is the audit team's opinion that the root of this ongoing problem of ineffective slash management is the lack of a clear Government policy requiring waste fibre management on Crown lands in Ontario. Other jurisdictions such as Manitoba have mandated that all waste fibre be left within the harvest area away from roadside. The most recent Provincial level recommendation related to slash occurred in the 2002-07 IFA for the Romeo Malette Forest. A component of the action plan to address the recommendation looked to the Stand and Site Guide, under development at the time, to provide direction.

In the audit team's view, the Stand and Site Guide, now released, does not adequately address the loss of productive forest land to slash because the guideline definition allows for unrestricted local variation of application, and the actual guideline, which uses the ambiguous wording (see underlined text) '*Unutilized woody material ... will be piled, redistributed, or otherwise treated to increase area available for regeneration*', allows too much flexibility in managing slash and thus allowance to continue with current practices, which are not dealing with the issue of significant, long term losses of productive forest area. As an example, leaving slash unpiled at roadside in anticipation of eventual natural recycling could be construed as an acceptable 'treatment to increase' available area.

To verify the predicted inadequacy of the Stand and Site Guide in dealing with slash, the auditor spoke with one of Tembec's forest management planning staff currently working on completing a new FMP, which must heed the Stand and Site Guidelines (SSG), for another management unit in Northeastern Ontario. This representative noted that Tembec's standard slash management policy has been included in the draft FMP and is expected to meet the SSG requirements. It is the auditor's opinion that Tembec's slash management policy allows for leaving large areas of slash untreated and has been ineffective in minimizing productive land loss and therefore does not meet the intent of the SSG direction.

Conclusion:
When preliminary audit findings were discussed during the closing meeting held at the end of the field segment of the audit, the sentiment from company representatives was that current slash management practices will not considerably change until clear Provincial direction to do so is provided; the auditors concur. The history of poor slash management in Ontario continues, as illustrated by current practices on the Abitibi River Forest. Despite repeat findings and recommendations in the Independent Forest Audits, the Province has failed to develop effective policies and guidelines that lead to appropriate practices on the ground to address the loss of productive forest land to slash. The auditors forecast that direction in the Stand and Site Guide will not substantially change this.

Recommendation 12: Corporate MNR must develop a policy to address waste fibre management, consistent with the intent of minimizing losses of productive forest land, and provide associated direction to MNR regions, districts and the forest industry, including standards for acceptable allowances for conversion of productive forest land to non-productive forest land. MNR should also periodically report to the public the cumulative loss of area and growing stock potential due to forest land occupied by waste fibre.

Independent Forest Audit – Record of Finding

Recommendation 13

Principle: 3. Forest Management Planning

Criterion: 3.5.12 Determination of Sustainability

Procedure: Assess whether the FMP provides for the sustainability of the Crown forest on the management unit based on the collective achievement of the objectives, comparison of proposed operations to the LTMD and the associated rationale for any management objectives that are not achieving the desired levels.

Background Information and Summary of Evidence:
There is no direction in the 2010-12 CP regarding management of chipping debris.

Discussion:
According to company representatives there is a plan to increase in-bush chipping on the Abitibi River Forest in the near future.

Conclusion:
While in-bush chipping can reduce slash accumulation, chipper debris can become a localized issue and an impediment to objective achievement. The auditors have found that excessive chipper debris has been an issue on many other management units in Ontario and that lack of clear direction on how to deal with the material is often a root cause.

Recommendation 13: ARFMI must include direction regarding management of chipping debris in the next FMP.

Independent Forest Audit – Record of Finding

Recommendation 14

Principle: 3. Forest Management Planning

Criterion: 3.5.7 FMP renewal, tending, protection and renewal support

Procedure: 1. Assess planned implementation of the management strategy by assessing whether the:

- renewal, tending and protection operations have been planned as required of the applicable FMPM, including any proposed prescribed burns, aerial herbicide tending, eligible pest management areas, aerial application of insecticides
- forecasts are consistent with the proposed management strategy (e.g. the levels required to achieve management objectives) and whether any differences are material

Background Information and Summary of Evidence:
The proposed management strategy selected for the 2010-12 CP forecast a planned renewal intensity ratio of 61% Extensive, 35.5% Basic and 3.5% Intensive. Table FMP-21 shows a renewal program of 77% Extensive, 16% Basic and 7% Intensive. This is a significant deviation in planned renewal intensities vs. the management strategy (i.e. much more Extensive and a little more Intensive and much less Basic). Renewal operations for the 10 year forecast (2010-20) in FMP-21 were determined to be consistent with the LTMD, however they have little relevance since they will not be carried forward in the 2012-22 FMP.

Renewal, tending and protection operations forecast for the 2010-12 CP were based on areas harvested in 2008-09 and areas planned in the AWS for harvesting 2009-10. Renewal, tending and protection operations forecast for the 2010-12 CP were not based on SFMM modelling outputs, instead they were determined by each individual SFL holder and MNR staff based on their own knowledge of the harvest areas. It was determined that the 2010-12 CP provided inadequate analysis and supporting information to justify the planned deviation from the LTMD during that two year period.

Block listings of the planned renewal activities on the IFF, CMRMU and SRFF were reviewed and it was found that there is insufficient information and analysis to substantiate the renewal activities planned in FMP-21 (2 year contingency period), particularly when compared to the renewal modelled.

Interviews and documentation indicate that a 2010-20 FMP (for which the 2010-12 CP was to be the first two years) is no longer being considered; instead a 2012-22 FMP is to be implemented.

Section 4.8.3 in the CP (comparison of proposed operations to the LTMD) provides an erroneous analysis of the proposed renewal operations (2010-2012) vs. the LTMD stating that "*more planting over natural regeneration is planned*". However, planned planting area shown in Table 38 does not correspond with planned planting in Table FMP-21 (21,087 ha vs. 4,252 ha). The Table 38 planned planting value was determined to be an error as was the statement that more planting is planned over natural regeneration. The planned amount of planting is 4,252 ha (FMP-21), ~10,000 ha short of the planting levels required to meet the proposed management strategy.

Part B, Section 4.8 of the 2004 FMPM states, in part, *"If proposed types and levels of operations deviate from the projections in the LTMD, a discussion of the effects on objective achievement and sustainability will be provided."*

Because the large planting discrepancy was not recognized during plan preparation, no discussion or analysis was provided in the CP which substantiates the significant deviation from the modelled renewal program

Discussion:
It is important that planned renewal activities are consistent with the management direction in the FMP or that sufficient analysis and rationalization is provided in the plan to substantiate significant deviations. If a 2010-20 FMP was developed and planned renewal was consistent with the 10 year forecast in FMP-21 of the 2010-12 CP there would be no issue. However, if a new 2012-22 FMP is developed, there will be little linkage to the prior contingency plans and reconciliation of deviations between planned and modelled renewal may not occur.

The requested analysis, rationalisation and reconciliation of the planned renewal operations during the 2010-12 period will be tabled in the 2012-22 FMP since the current CP will expire in 2012 and any requested amendments to the plan would likely not receive approval until after plan expiry.

Conclusion:
The deviation between modelled and planned renewal in the 2010-12 CP for the amalgamated forests, which select more extensive treatments than modelled, does not meet FMPM requirements - 2004 FMPM (A-53 ln 4-6) states "*The levels of renewal and tending operations will be consistent with the projected levels of the proposed management strategy and the results of the renewal and tending analysis".* Similar direction is included in the 2009 FMPM so a recommendation is made.

Recommendation 14: ARFMI must consider the renewal profile selected in the 2010-12 CP when developing the profile for the next FMP and include sufficient analysis in the 2012-22 FMP to justify the significant deviation from the planned LTMD during the two year contingency period.

Independent Forest Audit – Record of Finding

Recommendation 15

Principle: 3 Forest Management Planning

Criterion: 3.5.10.2 FMP monitoring programs

Procedure: Assess whether the monitoring programs to be implemented, including forecast level of assessment, are sufficient to assess the compliance and program effectiveness on the management unit.

Background Information and Summary of Evidence:
Table FMP-1 of the 2010-12 CP indicates 172,583 ha of Managed Crown Production Forest are below regeneration standards (about 9% of the Production Forest). Assuming harvest and renewal rates were relatively equal over the past several years this equates to about 17,000 ha that require regeneration surveying annually.

Table FMP-25 indicates 22,189 ha is to be surveyed over the 2010-12 period (about 11,000 ha yearly). This is approximately 6,000 ha short of the expected annual level of survey needed to at least maintain the proportion of area deemed below regeneration standards.

Discussion:
The forecast deficit of renewal assessment will lead to an increase of area classified as below regeneration standards. Additionally, underachievement in areas surveyed leads to delays in assessing silviculture success.

Conclusion:
Timely assessment of renewing land is needed to ensure the FRI is kept current and to determine if renewal efforts on the landbase are consistent with the LTMD. Increasing area classified as below regeneration standards contributes to uncertainties in the FRI and FMP modelling.

The 2004 FMPM (B-99 ln 8-10) states "*The amount of area to be assessed for success should be consistent with the level of regeneration success required to meet plan objectives and the management strategy as well as levels of past disturbance (i.e., harvest and natural).*" This direction needs to be followed.

Recommendation 15: ARFMI must review the planned renewal assessment program in the 2010-12 CP to ensure that the next FMP covers the existing shortfall.

Independent Forest Audit – Record of Finding

Recommendation 16

Principle: 4. Plan Assessment and Implementation

Criterion: 4.3 Harvest - To review and assess through field examination whether information used in preparation of the FMP was appropriate and assess the implementation of the management strategy.

Procedure: Review and assess in the field the implementation of approved harvest operations. Include the following:

- assess whether: the harvest and logging methods implemented were consistent with the FOP; the FOP was consistent with the SGRs; the FOP was certified by an R.P.F. or other qualified individual, and actual operations, were appropriate and effective for the actual site conditions encountered

Background Information and Summary of Evidence:
According to the 2010-12 CP:

> *"There are a few small stands on the traditional Iroquois Falls Forest which are included in the plan as second pass harvest opportunities. Depending on the market for poplar, these stands may be harvested. They are shown on the Operations Maps. The estimated area of second pass is 1,302 hectares and the estimated volume is 37,257 m3 of white birch and poplar. There are no second pass blocks included for the traditional Cochrane-Moose River and Smooth Rock Falls Forests. Second pass blocks are areas that have been harvested in the past with a large amount of poplar remaining after harvesting".*

There were no two-pass harvest operations planned in the 2005-10 Iroquois Falls FMP or tracked in annual reporting during the audit term and none were observed during the field audit. AbiBow staff noted that stands do exist that are awaiting a second pass to remove poplar trees - this occurred because conifer was harvested from these sites then the market for poplar declined significantly and it was decided to leave the poplar standing for possible future use.

Discussion:
One issue with these stands is that they were not originally planned as two-pass harvest and are not being tracked as such in annual reporting or the compliance program (discussed in the monitoring section).

The most important issue with these stands is that renewal efforts are being significantly delayed while waiting for a market for the poplar. If they are not harvested, the residual trees have the potential to interfere with the successful establishment and development of the subsequent stand. According to the Silvicultural Guide to Managing for Black Spruce, Jack Pine, and Aspen on Boreal Forest Ecosites in Ontario "*these stems must be treated (e.g. felled, girdled, treated with herbicide). Otherwise this stand will be considered to have been "high-graded." Highgrading, a practice which does not sustain forest ecosystems, is in direct conflict with and contravention of Section 1 of the Crown Forest Sustainability Act".*

Conclusion:
The 2010-12 CP includes utilization strategies that were developed based on the Northeast Region Operations Guide for Marketability Issues (2008). This includes the following regarding two-pass harvesting:
"*Areas identified as first pass harvest require a second pass for the treatment to be considered completed. The second pass harvest should normally be conducted within two growing seasons of first pass as to not to negatively impact the quality or condition of the future stand; however a three year maximum time frame is provided to allow for operational flexibility. After a three year period, if no second pass harvesting has occurred due to lack of markets:*

- *renew as a clearcut under the regular clearcut silviculture guides (i.e. remove the canopy trees or knock them over), promoting natural regeneration or creating planting spots; or*
- *Renew as a partial canopy removal (shelter wood system) under the Silvicultural Guide to Managing for Black Spruce, Jack Pine, and Aspen on Boreal Ecosites in Ontario (OMNR 7 1997) which will require conifer under-planting, follow-up understory management, and a provincially coordinated monitoring program. If "first pass" depletion areas are not fully utilized by completing "second pass" harvesting or renewed according to the "first pass" renewal options, and number 1 above is not the preferred renewal option these sites will be considered an exception to the silviculture guides".*

This direction must be followed.

Recommendation 16: ARFMI must assess the stands listed as second pass in the 2010-12 CP and, where three or more years have lapsed since removal of the conifer, follow the CP direction related to two-pass harvesting so successful renewal of the stands can occur.

Independent Forest Audit – Record of Finding

Recommendation 17

Principle: 4. Plan Assessment and Implementation

Criterion: 4.3 Harvest - To review and assess through field examination whether information used in preparation of the FMP was appropriate and assess the implementation of the management strategy.

Procedure: Review and assess in the field the implementation of approved harvest operations. Include the following:

- assess whether: the harvest and logging methods implemented were consistent with the FOP; the FOP was consistent with the SGRs; the FOP was certified by an R.P.F. or other qualified individual, and actual operations, were appropriate and effective for the actual site conditions encountered

Background Information and Summary of Evidence:
There has been a long history of slash management issues on the Iroquois Falls Forest (actually dates back to the old Iroquois Falls Forest (sometimes known as Iroquois North) and Iroquois Falls South Forest prior to their amalgamation). The 1995-2000 IFA for the Iroquois Falls (North) Forest noted that the 1995 FMP Review (for the 1990-95 period) had identified slash as an issue on the Forest and recommended that "*the company and MNR work together to develop a system for slash disposal or reduction on the Forest*". The 1995-2000 IFA noted little improvement in slash management and recommended ACI develop an effective slash management strategy and implement it immediately in the 2001-02 AWS. The 1995-2000 IFA for the Iroquois Falls South Forest also included a recommendation that ACI and Tembec expand slash management activities to deal with all suitable current areas and treatable backlog areas.

The 2000-2005 IFA for the amalgamated Iroquois Falls Forest noted that actions for the 1995-2000 IFA slash recommendations were incomplete for both forests. The auditors noted that:

> *"Considerable slash pile burning was observed during the field audit. However, there were many areas where piles were not burned. High costs, weather, and inadequate funds were cited as the reasons".*

Thus, the 2000-2005 IFA for the amalgamated Iroquois Falls and Iroquois Falls South Forests also included a slash recommendation: "*Abitibi should establish a measurable target and a schedule for slash reduction over the next five years*".

The audit action plan status report for this recommendation includes five action items:

- Maximize utilization by reducing topping limit from 10 to 5cm;
- Select areas for slash piling and burning to maximize ground recovery;
- Use alternate slash reduction methods such as narrow windrows;
- Test other methods of slash reduction such as mulching along edges;
- Investigate alternate uses of slash such as bio-energy production.

The status of four of the five action items was considered completed in the status report. The main item related to actual ground recovery, bullet two above, was considered not completed. Rationale for non completion of the action was provided.

Discussion:
Instead of choosing to increase the rate to ensure adequate funds in the FRT account, AbiBow chose to over-draw the account and suspend 'non-critical' silviculture activities including adequate slash management. Anticipated amalgamation with the three other management units was employed as a way of balancing the FRT account while the 2010-12 CP for the amalgamated forest was identified as the vehicle for future slash management direction. As discussed in the Forest Management Planning section of this audit report, the slash management plan included in the 2010-12 CP allows for leaving slash untreated at a majority of planned harvest areas and converting significant amounts of forested land to non-forest condition.

The decisions made by AbiBow during the audit term effectively deferred considerable real action related to slash management. The slash left untreated during the audit term and planned to be left in the 2010-12 CP will be a significant physical and chemical impediment to renewal of productive Crown land. In the audit team's view this does not fulfill the recommendation made in the 2000-2005 IFA.

While there are many options for reducing slash at roadside, piling and burning had been the preferred choice to regain maximum productive area. However, negative public comments regarding smoke, difficulty getting MNR approval to burn, saturated conditions during planned ignition and high costs relative to net area recovered became impediments to slash piling and burning. Also, the predominance of winter harvest and need to haul wood before spring thaw meant slash management was not a company priority. In the absence of clear Provincial direction, less intensive options such as piling with no burning or leaving slash un-piled gained favour.

The 2005-10 Iroquois Falls FMP contained slash management as a strategy for meeting two plan objectives. For Objective 3.4.1.4:

- *Silvicultural practices that retain logs, stumps and slash distributed over the site will be encouraged*
- *Full tree harvesting will be avoided as much as possible. Where it does occur, slash will be re-distributed and if it cannot be re-distributed it will be reduced at roadside through slash pile burning prescribed burns or other means;*

For objective 3.4.4.2 a target of <3% conversion to roads, landings and slash is set and the slash strategies included are identical to the audit action plan status report items for the 2000-2005 IFA (see five bullet points earlier in this section).

Slash is also included in the road management strategies section of the FMP:

- *One (1) meter of height minimum of downed woody debris or slash should be deposited on the broken road surface to provide future nutrient material.*
- *Slash and downed woody debris will be placed over the road right-of-way for a minimum of 200 meters at the origin of all roads to prevent/reduce vehicular access.*

The slash management program is also discussed in the silviculture section of the 2005-10 FMP. The objective of slash piling is to maximize the amount of area available for regeneration so slash piling is prescribed on all forest units while slash burning is to be prioritized on upland mixedwood and pure conifer stands. Table FMP-25 indicates that 610 hectares (net) are planned for slash pile and burn at a cost of $564,000.

The slash management program audited for the 2005-10 term did not meet the planned program and there was obvious degradation through the audit term. Management in areas operated during the audit term consisted of piling and burning some slash, particularly in the first year or so of the audit term, piling slash with no burning and leaving slash un-piled. There was no noticeable avoidance of full tree harvesting or 'encouraging' of practices that leave slash distributed on the site as per objective 3.4.1.4. In addition, alternatives to piling and burning were not observed and AbiBow staff had no knowledge of alternatives that had taken place.

Conclusion:
Continual improvement is cited as an over-arching objective by the forest sector. According to the Compliance Plan for the 2005-10 FMP: "*Abitibi is committed to the continual improvement of the environmental performance and sustainable forest management in all our woodlands activities*". Slash management should have improved through time rather than regressed. In the absence of Provincial direction (discussed with a recommendation in the Forest Management Planning section of the audit), forest managers have opted for cost cutting measures that do not allow for adequate management of waste fibre.

The slash management program delivered was not considered effective by the audit team and did not fulfill prior IFA recommendations and associated audit action plans related to reducing slash on the Forest. Further, the slash management plan in the 2010-12 CP is deemed inadequate to minimize loss of productive Crown land. Looking forward, it is the audit team's opinion that the current slash management plan will not meet the intent of the related guidelines in the Stand and Site Guide (see Rec 12).

Recommendation 17: ARFMI must ensure the slash management plan in the 2012-22 FMP can meet plan objectives and guidelines focused on minimizing loss of productive land. ARFMI should also deal with treatable backlog areas of slash.

Independent Forest Audit – Record of Finding

Recommendation 18

Principle: 4 Plan Assessment and Implementation

Criterion: 4.1 Plan Assessment – To review and assess through field examination whether information used in preparation of the FMP was appropriate and assess the implementation of the management strategy.

Procedure: 1. In the conduct of the field audit examine areas of the FMP that can be assessed in the field and assess whether the FMP was appropriate in the circumstances. Include consideration of:

- modelling assumptions
- SGRs e.g. overall relevance to management unit as seen in the field (all being implemented as per management alternative/strategy or portion is planned reflective of field application).
- Proposed harvest, renewal and tending areas for consistency with eligibility and selection criteria.

Background Information and Summary of Evidence:
Careful Logging Around Advanced Growth (CLAAG) or Harvesting with Regeneration Protection (HARP), depending on the pre-harvest forest condition is a harvesting system used on lowland sites to protect advanced growth black spruce. CLAAG and HARP are well suited to most of the lowland sites that dominate the area. Effective CLAAG and HARP prescriptions were viewed during the field audit and it was evident that operators are well trained and very proficient at implementing careful logging techniques on lowland black spruce sites, which are abundant on the Iroquois Falls Forest. Areas harvested under the CLAAG and HARP systems were found to have sufficient advanced regeneration spruce in the leave strips while site impact within harvest corridors was minimized, thus providing the requisite microsite for natural seeding or potential fill planting.

However, operators have become over-reliant on this system and careful logging is implemented on virtually all sites. Careful logging techniques are not well suited to upland sites since the advanced regeneration in leave strips often consists of undesirable species. Careful logging viewed on most upland sites was deemed to be ineffective. Little advanced growth was present to protect in some areas and shrubs now dominate. In other areas regeneration mainly consists of balsam fir, balsam poplar and birch – less desirable species than the spruce and aspen harvested. Considerable active renewal through chemical and/or mechanical site preparation, planting and tending will be needed to meet standards on some of these sites. Other sites will naturally renew to less desirable species.

As indicated in the TAR for the Iroquois Falls Forest; *"Although the total area regenerated by Forest Unit is acceptable, the future forest units being created by the treatments do not appear to be meeting projections."*

Upland careful logging harvest further hampers active renewal efforts by reducing available planting areas and presenting tending challenges; this was noted during the audit. On these sites planting densities were constrained due to lack of planting spots and heavy shrub and presence of less desirable tree species. Average planting density throughout the term was 1,351 trees/ha compared to the targeted density of 1,800 trees/ha.

The *Silvicultural Guide to Managing for Black Spruce, Jack Pine and Aspen on Boreal Forest Ecosites in Ontario* (Silvicultural Guide) states that CLAAG can increase the proportion of balsam fir in the future stand and that the use of advanced growth may be used to enhance other regeneration treatments. The Silvicultural Guide also provides clear direction on the types of sites which natural advanced growth is recommended, conditionally recommended and not recommended (NR). Not recommended activities are described as being not ecologically appropriate or not supported by field experience and field knowledge. The use of not recommended activities requires the implementation of exceptions monitoring.

Discussion:
The 2010-12 CP SGRs no longer permit CLAAG or HARP on upland sites; however there is now a compliment of upland sites treated in this manner that will regenerate to poor quality stands unless remedial treatments are undertaken. Some of these sites will be too expensive to treat, however the effort should be made to identify and treat those that are practical to do so.

Also, should it be determined during the review of these sites that NR activities have been implemented, such as the use of natural advanced growth as a regeneration method on upland sites, that exceptions monitoring be implemented as per the requirements of the FMPM and the Silvicultural Guide.

Conclusion:
The implementation of CLAAG harvesting patterns on upland sites is contributing to the retention of less desirable species, particularly larch and balsam fir, and is leading to a degraded stand condition in terms of species composition and stocking.

Recommendation 18: ARFMI must:

a) conduct an immediate review of all upland sites harvested under the CLAAG system since 2005 and implement remedial silvicultural treatments, where practical, on sites found not likely to become a silvicultural success.
b) implement exceptions monitoring on all upland CLAAG sites for which the use of natural advance growth (without planting) as a regeneration method is deemed as not recommended under the Silvicultural Guide.

Independent Forest Audit – Record of Finding

Recommendation 19

Principle: 4. Plan Assessment and Implementation

Criterion: 4.1 Plan Assessment – To review and assess through field examination whether information used in preparation of the FMP was appropriate and assess the implementation of the management strategy.

Procedure: 1. In the conduct of the field audit examine areas of the FMP that can be assessed in the field and assess whether the FMP was appropriate in the circumstances. Include consideration of:

- modelling assumptions
- SGR's e.g. overall relevance to management unit as seen in the field (all being implemented as per management alternative/strategy or portion is planned reflective of field application).
- proposed harvest, renewal and tending areas for consistency with eligibility and selection criteria.

Background Information and Summary of Evidence:
It was noted that, due to lack of markets, larch trees were often left standing on site following harvest as part of the NDPEG requirements. Larch is a prolific seeder and dense larch regeneration was found in many of the lowland stands audited. It was evident that larch is becoming more prevalent in some stands; this increase from one generation to the next is sometimes called 'creep'.

Furthermore, upland CLAAG harvesting patterns were broadly implemented on most harvested sites. Although the majority of areas harvested were well suited to this type of harvesting (lowland black spruce peatland) implementation on upland sites resulted in a significant retention of undesirable species.

Larch creep has some history on the Forest. Older stands viewed for FTG often had higher larch components than the original stand composition; this is being captured in monitoring and reporting for the Forest. As indicated in the TAR for the Iroquois Falls Forest; *"Although the total area regenerated by Forest Unit is acceptable, the future forest units being created by the treatments do not appear to be meeting projections."*

Older stands viewed for FTG often had higher larch components than the original stand composition; Table AR-13 in the TAR indicates that SB3 (black spruce peatland) treated to bring back SB3 was only successful 60% of the time. SFMM post-renewal forest succession forecasts that 100% of SB3 FUs will renew back to SB3 under both basic and extensive treatment regimes. The retention of unmarketable larch trees which are known to be prolific seeders is a primary contributor to the observed FU shift.

Increased presence of less desirable tree species such as balsam fir, balsam poplar, etc. is common with the implementation of CLAAG harvesting on upland and transitional stands. FTG results in the TAR from 2005-09 show that 71% of the SB1 FUs (black spruce, intermediate moist slope) areas surveyed are not regenerating back to the SB1 FU. Comparatively the SFMM post renewal forest succession forecasts a 78% transition to SB1 under extensive renewal treatments, 90% under basic renewal treatment and 100% with intensive renewal treatments. Observed silvicultural failure for SB1 FUs is largely attributed in the TAR to harvest method. *"The movement to mixed spurce/fir/pine/poplar is largely attributed to the method of harvest which tends to leave corridors of residual species such as, balsam fir and aspen. This trend will continue as long as the harvest method and subsequent silviculture maintains other species."*

Discussion:
The main issue is that transition of significant amounts of area from forest units dominated by preferred tree species to those with less preferred tree species, such as larch, is a threat to forest sustainability. There has historically been very little market for larch, balsam fir or balsam poplar and this may not change.

It is suggested that the following modifications to operational practices be implemented:

- Best management practices implemented during harvesting activities to minimize the retention of larch trees as 'snags'. Trees should be felled or stubbed and left on site to prevent seeding. This practice has been implemented in the Red Lake District to minimize birch seeding in the Caribou management zone.
- Proper assessment of stand site suitability and black spruce advanced growth potential is needed prior to harvest

implementation. This will likely require the physical delineation of CLAAG harvest areas vs. areas requiring conventional clear cut harvesting. The implementation of GPS systems during harvest would also allow operators to easily differentiate appropriate harvest prescriptions.

- Site preparation using sheer blades can be used as a remediation tool on sites with significant advanced growth of undesirable species (particularly Bf).

Conclusion:
Forest unit transition trends are moving beyond the modelled limits of the FMP. It was determined that operational practices are a primary contributor to the retention and proliferation of less desirable tree species on the IFF. Modifications to current operational practices are needed to ensure that a sustainable volume of marketable tree species is maintained on the Forest.

Recommendation 19: ARFMI must address the increase in presence on the Forest of less desirable tree species such as larch and balsam fir.

Independent Forest Audit – Record of Finding

Recommendation 20

Principle: 4. Plan Assessment and Implementation

Criterion: 4.7 Access

Procedure: 1. Review and assess in the field the implementation of approved access activities.

- Select a representative sample of each type of access activity (road construction, various types of water crossings – winter, culverts, bridges, road maintenance, decommissioning) from primary, secondary/branch and tertiary/operational roads constructed during the five-year period of the audit; include category 14 and category 9 aggregate pits for new roads and existing roads
- Determine whether the operations implemented were consistent with *Aggregate Resources of Ontario Provincial Standards*, category 9 aggregate permits.

Background Information and Summary of Evidence: A number of aggregate pits were examined during the field audit. Most of the pits were found to be in good condition; however several did not meet the requirements of relevant pit standards.

Examples were seen where pit standards had not been abided by including lack of rehabilitation sloping and operating next to the tree line.

Discussion: Aggregate pits need to be maintained in accordance with the respective Ontario standard. These standards ensure public safety, operational safety and visually sensitive rehabilitation.

Recommendation 20: ARFMI must ensure that aggregate pits are operated in accordance with the relevant standard.

Independent Forest Audit – Record of Finding

Recommendations 21 and 22

Principle: 6. Monitoring

To determine whether the monitoring program developed for the management unit, as well as associated reporting obligations met the requirements of manuals, policies, procedures and the SFL. To determine whether these monitoring and reporting programs, as implemented, were sufficient to monitor and report on the effectiveness of forest operations in meeting FMP objectives.

Criterion: 6.3.2 Silviculture Standards and Assessment Program

Procedure: 2. Assess whether the SFL/management unit assessment program is sufficient and is being used to provide the required silviculture effectiveness monitoring information including whether it

- assesses overall effectiveness of treatments, including those that are exceptions to silvicultural guides i.e. documented program, survey methodology such as survival, stocking, free-to-grow surveys, records, use and evaluation of results e.g. appropriateness of treatment for actual site conditions
- determines the need for and the type of remedial action required if an area is not successfully regenerated (e.g. in-fill plant, tending)
- assesses reasons where eligible areas are not determined to be successfully regenerated and addresses these situations
- is appropriately used to update the FRI
- assesses progress towards achieving the management strategy

Background Information and Summary of Evidence:
Budgetary and staffing cut backs starting in 2006 severely affected the company's ability to monitor regenerating stands and effectively prescribe remedial treatments such as fill planting and tending so as to ensure the accomplishment of the minimum SGR standards. The following deficiencies in AbiBow's SEM program were noted:

- Tending assessments performed during the term were done in an informal manner with no supporting documentation.
- FTG surveys were postponed in 2008 and 2009 contributing to a significant underachievement of FMP targets (50% of planned).
- Survival plots were established on new plantations at a frequency of one per 100,000 trees from 2005-2008. However follow up 2nd and 5th year assessments of survival plots where not conducted from 2006 on.
- Assessments of areas prescribed for natural regeneration where not conducted in 2009 effectively creating a backlog of NSR area on the Forest.

Interviews with remaining staff confirmed that very little SEM was conducted during the term. Some blocks viewed during the audit fell short of the intended prescription due primarily to a lack of tending or fill planting. The Bowyer 10 Block was found to have stocking levels below the minimum SGR targets and was deemed to require subsequent tending and fill-planting. Challies 18 had been planted however subsequent tending had not occurred on portions of the block effectively encroaching planted trees. Failure to implement remedial treatments on such areas will likely result in regeneration failures.

Discussion:
It is evident that a comprehensive and systematic monitoring system is needed to measure the efficacy of implemented silvicultural treatments and identify the need for follow-up treatment to satisfy the direction and intent of the prescribed SGR.

Silvicultural effectiveness monitoring duties are now the responsibility of ARFMI which contracts FRMG as the primary service provider. It is the opinion of the audit team that FRMG has in place adequate system and staffing support to sufficiently execute a complete and comprehensive SEM program. A thorough assessment of FRMG's execution of their SEM model will be completed during the next IFA.

Conclusion:
An effective SEM program is needed to ensure that the LTMD outlined in the FMP is effectively being executed on the Forest.

Recommendation 21: ARFMI must address the backlog of area that requires assessment of natural regeneration.

Recommendation 22: ARFMI must ensure that sufficient system and staffing support is available to properly execute the SEM program.

Independent Forest Audit – Record of Finding

Recommendation 23

Principle: 6. Monitoring

To determine whether the monitoring program developed for the management unit, as well as associated reporting obligations met the requirements of manuals, policies, procedures and the SFL. To determine whether these monitoring and reporting programs, as implemented, were sufficient to monitor and report on the effectiveness of forest operations in meeting FMP objectives.

Criterion: 6.3.2 Silviculture Standards and Assessment Program

Procedure: 3. Assess the actual level of the overall monitoring program including whether

- it was in accordance with the FMP, including silviculture guide exceptions monitoring, and whether it was appropriate based on the field audit and other evidence gathered through analysis of related criteria
- the amount of area eligible for survey is consistent with past levels of harvest and whether all areas are being addressed

Background Information and Summary of Evidence:
Free to grow surveys were conducted on the Iroquois Fall Forest in 2005, 2006 and 2007. AbiBow suspended the FTG monitoring program for the remainder of the term due to budgetary and staffing constraints. Areas surveyed during the first three years of the term were close to the annualized forecast in the FMP (83% of FMP annualized forecast). However, FTG survey targets for the term were underachieved due to lack of survey work in 2008 and 2009.

During the term 19,574 ha were surveyed for free growing status. Only 50% of the planned levels (39,454 ha) of assessment were achieved during the plan term.

Discussion:
The accomplishment of planned FTG targets plays an important part in determining if implemented renewal treatments are effectively achieving the planned management strategy and ensuring that the FRI is up to date and accurate. Considering the low level of silvicultural success (41%) for areas surveyed in 2005, 2006 and 2007 and the FU unit shifts discussed in monitoring section of the report a complete assessment of areas planned for FTG assessment in the FMP is needed.

AbiBow implemented severe fiscal constraints across all of its operations due to the company entering CCAA bankruptcy protection in 2009 as a result of severe market curtailments. Subsequent reduction in its silviculture expenditures and staffing resources in 2008 and 2009 led to program deliverables which fell short of planned renewal levels and subsequently were not in line with the FMP's LTMD.

Conclusion:
The FTG backlog on the Iroquois Falls forest must be addressed to ensure a correct determination of renewal and silvicultural success.

Recommendation 23: ARFMI must address the backlog of FTG surveys on the Iroquois Falls Forest.

Independent Forest Audit – Record of Finding

Best Practice 2

Principle: 6. Monitoring

Criterion: 6.3.2 Silviculture Standards and Assessment Program

Procedure: 2. Assess whether the SFL/management unit assessment program is sufficient and is being used to provide the required silviculture effectiveness monitoring information including whether it:

- assesses overall effectiveness of treatments, including those that are exceptions to silvicultural guides i.e. documented program, survey methodology such as survival, stocking, free-to-grow surveys, records, use and evaluation of results e.g. appropriateness of treatment for actual site conditions
- determines the need for and the type of remedial action required if an area is not successfully regenerated (e.g. in-fill plant, tending)
- assesses reasons where eligible areas are not determined to be successfully regenerated and addresses these situations
- is appropriately used to update the FRI
- assesses progress towards achieving the management strategy

Background Information and Summary of Evidence:
The Cochrane District MNR implemented a silvicultural effectiveness monitoring program in 2005 covering two SFLs (SRFF and IFF north) and one Crown managed unit (CMRMU). The Kirkland Lake District MNR implemented its own SEM program for the former Iroquois Falls South unit. The program was based on Provincial directives, which were used to develop core monitoring tasks and minimum sampling targets for the District. The primary focus of the program was the assessment of FTG submissions through both aerial surveys and intensive ground surveys using the Well Spaced Free Growing methodology. Discrepancies between company submissions and MNR audit results were thoroughly discussed and analyzed. MNR also analysed FTG results with regards to silviculture success and trends in forest unit transitions. In addition, MNR audited the effectiveness of specific silviculture activities such as tree planting, tending, slash piling/burning and aerial seeding.

The program was implemented in each year of the audit term starting with the 2005 field season. A report was completed the following year for each field season; thus four reports were reviewed for the audit (2010 field season report not available until 2011). SEM results were presented annually to the SFL holders and/or service providers to identify shortcomings in the silviculture program. When necessary, MNR and company staff jointly developed strategies and required action plans to address critical issues.

Discussion:
Silvicultural effectiveness monitoring is an integral part of a successful silviculture program. The District MNR SEM programs were successfully implemented during a period when most company monitoring programs were being suspended due to budgetary and staffing constraints. The District programs are providing valuable data and analysis concerning the success of implemented silvicultural activities. MNR staff is cooperatively working with company staff to meet information requirements.

Conclusion:
The Cochrane District Kirkland Lake MNR SEM program provides significant value with respect to monitoring, assessment and analysis of company FTG submissions and implemented silvicultural activities and identifying important silviculture trends. The maintenance of this program during challenging economic times and the cooperative working relationship with company staff set this program above the norm.

The audit team also determined that MNR completed outstanding work with regards to compliance monitoring (discussed in Monitoring section). This Best Practice was developed to recognize both of these areas of excellence.

Best Practice 2: The monitoring of silviculture effectiveness and compliance by the Ministry of Natural Resources during the audit term was deemed to be excellent.

Independent Forest Audit – Record of Finding

Recommendation 24

Principle: 6. Monitoring

Criterion: 6.2.1 SFL Holder Compliance Planning and Monitoring

Procedure: Determine whether the FOIP reports have been submitted electronically to the MNR database in accordance with requirements including timelines specified in MNR procedures and FIM.

Background Information and Summary of Evidence:
When operations were suspended during the audit term for a period greater than 20 working days suspended operation reports were completed but the duration of many suspensions and the content of suspension reports was found to be an issue. Some direction from ENF Policy 22.02.01 related to suspended reports is: "*The suspended report will be assessed as In Compliance With Comments and must include a "task issue" which states the problem, identifies what work/operation is completed and yet to be completed, when the work/operation is expected to be completed and who will be responsible for its completion. Where a continuation of operations is outside the current approval period, MNR must ensure that the work to be done is included as a condition of the next year's approval (AWS). It is incumbent upon the licencee to apply to have the measurement-haul and processing date in the approval extended. Where the specified timeline for completion is not met,* MNR will undertake a spot check inspection and compliance action will be taken as required."

According to FOIP as of early October 2010 there are 69 suspended reports; based on April 1, 2008 Compliance Handbook direction, 50 reports over two years old are overdue:

- 5 reports date back to 2004
- 7 reports are from 2005
- 19 reports are from 2006
- 15 reports are from 2007
- 6 reports are from 2008

The tardiest report, from August 2004, notes that "*There are areas that are yet to be harvested within this block. These areas are scheduled to be harvested during March/05, which have been identified as frost harvest opportunities off of gravel road.*" A number of reports also note that harvest operations are suspended until frozen conditions permit operations to continue.

FOIP allows for reclassification of suspended reports when operations are completed. According to the Cochrane District MNR Compliance Technician, suspended reports during the audit term were not re-classified when operations were completed on blocks. Instead, a new FOIP was produced for the completed operations and tracking of block suspensions was accomplished using the 'Compliance at a Glance' worksheet.

While this has worked for Cochrane District, it is difficult for an outsider to determine the status of the suspended blocks. Follow-up operations should have occurred on many of these sites by now but, due to the process used during the audit term, this is not certain. MNR has noted that most of these blocks are now completed. As noted in the Forest Management Planning section, there are some stands on the Iroquois Falls Forest that are included in the 2010-12 CP as second-pass harvest opportunities (stands 15-17 and 34). One of these blocks (#15) accounts for one of the suspension reports. The block was suspended awaiting frozen ground conditions to finish harvest but also notes that "*Within the area of operation there is an area (43 ha) of unmerchantable timber that was bypassed in stand no. 53350 on the west side of the Dokis River road (south portion)*". This stand was classified as 99 year old spruce but must have had a large poplar component. The FOIP for block 34 also notes that "*areas will be bypassed within this block (portions of stands no. 7512, 7535 and 17574) primarily due to the small size of the timber*". So there is nothing regarding two-pass harvest in these blocks and they are not being tracked as such in FOIP. The Plan Assessment and Implementation section provides a recommendation to assess the status of these stands.

Discussion:
Several other suspended reports lack required detail regarding reasoning for suspension and a timeline for completion of operations. For example, Report #421480 simply notes "*The block will be converted to a summer access in order to extract the wood at roadside*" and Report #328274 discusses an ill-located crossing but no more

information is provided. The Compliance program has been extensively revamped; this came into effect on April 1, 2010. Suspension reports are no longer required; instead, operational status notifications are to be provided when operations are temporarily suspended (a maximum two-year period for suspending operations is still in place). Since there is no longer a requirement to complete suspension reports no recommendation is made regarding the lack of detail provided in some suspension reports prepared during the audit term.

The most important issue with the 'extended' suspension reports is the significant delay of required silviculture treatments that may have occurred while awaiting completion of harvesting, hauling or other operations.

Conclusion:
The overdue suspension reports discussed above must be dealt with appropriately to determine the renewal status of these blocks and identify any required treatments.

Recommendation 24: MNR must conduct spot checks on the outstanding suspension reports and determine compliance action to be taken.

Independent Forest Audit – Record of Finding

Recommendation 25

Principle: 6. Monitoring

Criterion: 6.5 Determine whether annual reports are prepared according to the FMPM and assess whether they accurately report implementation and assess progress in meeting objectives.

Procedures: 6.5.1 – 6.5.3; Review annual reports and compare against FMPM requirements and field observations.

Background Information and Summary of Evidence:
The ARs for the three years 2005-06 to 2007-08 showed silvicultural success rates of approximately 40%.

Discussion:
The Silvicultural Ground Rules (SGRs as per Table FMP-5) and the Annual Report Tables (AR-13 (2009) and AR-14 (2004)) assume that only one future forest unit is associated with a given SGR. This ignores the fact that forest units may succeed over time and that many treatments are expected to lead to a certain proportion of future forest units depending upon the current condition, the desired future forest condition and the level of inputs or intensity of treatments.

The projections made in the strategic model (SFMM) recognize the reality of multiple post-harvest and post-fire successional pathways. These forecasts are the first step in adaptive management, followed by implementation and monitoring. Variances in monitored outcomes are used to alter practices and improve future forecasts as part of a continual cycle of institutional learning. Adaptive management is a key forest policy element in Ontario.

Conclusion:
The FMPM reporting system does not recognize multiple successional pathways, leading to a breakdown in the adaptive management cycle at the monitoring phase. In addition, low silviculture success ratios as currently derived by the reporting procedures under the FMPM, may send the wrong signals to policy makers and the general public.

Recommendation 25: Corporate MNR must review the reporting procedures and consider modifying them to recognize multiple successional pathways to improve the adaptive management process.

Independent Forest Audit – Record of Finding

Recommendation 26

Principle: 8.1 Contractual Obligations – SFLs

Criterion: 8.1.9 Audit action plan and status report

Procedures: 8.1.9.2 Audit Action Plan Status Report meets requirements

Background Information and Summary of Evidence:
The Audit Action Plan Status Report associated with the 2005 IFA was required to be submitted by May 16, 2009. A Draft Status Report was submitted by the company to the MNR District for comments on May 14, 2009. The document was resubmitted to MNR District with edits on November 6, 2009. It was again resubmitted by FRMG to MNR District with further edits on July 20, 2010. The final Status Report was submitted on September 7, 2010 by the Cochrane District Manager and approved by the Regional Director on September 14, 2010 – 16 months late.

According to the Status Report, production of the final Status Report was delayed until August 2010 due to changes in staffing as well as significant changes in tenure resulting in the amalgamation of the Iroquois Falls Forest into the Abitibi River Forest. However, no documentation was provided to the audit team that indicated an extension to the required submission deadline had been granted.

Conclusion:
The auditee failed to meet the timelines set in the IFAPP for the submission of the Audit Action Plan Status Report.

Recommendation 26: The Cochrane District Manager must ensure that the submission timeline for the IFA Audit Action Plan Status Report is met.

Appendix 2 – Management Objectives Tables

2005-10 Forest Management Pan – Iroquois Falls Forest

Objective		**Auditor Comments**
Forest Diversity Objective Group		
Forest Unit Area	To maintain forest ecosystems described in terms of forest units for both sub-units combined, similar to the minimum and maximum ranges that would occur in a natural fire-driven Boreal Forest.	Partially Met. Free-to-grow data is indicating that landscape level species composition targets are not being met for certain forest units particularly SB3, SB1, SF1, SP1 & PJ1. The company's strategy to broadly implement careful logging practices on upland sites is a primary contributor to the observed shift. A recommendation has been included which addresses careful logging on upland sites. Implemented silvicultural intensities during the term were not consistent with the modeled LTMD ((71% ext. actual vs. 56% ext. LTMD) Careful logging was found to be properly implemented on lowland sites and tree plant species selection was in accordance with site conditions and species silvics. Mixedwood prescriptions were suitably implemented however there was a marked failure to implement SEM to determine the effectiveness of the FOP
White Pine and Red Pine	To increase the composition of white pine within existing suitable forest units and within other appropriate forest units as indicated in the SGRs.	Met. Minimum target of 1,000 White Pine seedlings planted annually
Forest Age Structure	To maintain a balanced age class structure by maintaining a minimum proportion of the forest unit groups within mature and over-mature age classes, and allowing for a sustainable level of harvesting of mature and over-mature age classes.	Met. Age-class constraints within the forest management model were used to create a harvest profile which would retain an appropriate mature and over-mature area on the landscape by forest group
Structural Legacy, Residual Stand Structure Within Harvest Patches	Provide structural elements within the harvest patches after harvesting that mimic natural fire as much as possible. To maintain the un-even aged and old growth stand structure in the existing HARP proportion of the Sb3 forest unit. Ensure that the 2005-2010 disturbance patches contain residual	Met. Implementation of careful logging practices on HARP SB3 FUs retained a sufficient amount of larger mature black spruce trees to maintain pre-existing un-even aged old growth structure

Objective		Auditor Comments
	(leave) patches within them that mimic the unburned patches within a fire (i.e. in terms of size, number, stand composition, orientation, and connectivity) according to the NDPEG guidelines as much as possible.	
Social and Economic Objective Group		
Timber Supply	To establish and promote a continuous, predictable and sustainable supply of wood to the user mills dependent on the Iroquois Falls Forest according to the long term (100 year) wood supply targets and the forest sustainability requirements. Promote the optimal utilization of available wood products through best end use in order to contribute the greatest value-added to the local economy for each cubic metre of timber harvested. Promote the utilization of secondary forest resources (e.g. low quality wood and marginally commercial species) in order to maximize the yield of forest products from each hectare of forested land being harvested.	Partially Met: Market collapse limits ability for meeting utilization objectives Sustainability issues: wood supply using non-spatial models forecast adequate supplies (implies sustainability) but this does not necessarily mean that wood supply can be sustained under current and forecasted pricing to be competitive with other jurisdictions Loss of productive land to slash may lead to decreased future timber supply
Integrated Resource Management	Co-ordinate forest management such that benefits to all users can be optimized while conflicts resulting from forest operations are minimized consistent with the Kirkland Lake District Land Use Guidelines, Cochrane District Land Use Guidelines and the Crown Land Use Atlas Policy (FMP-7). To provide for other forest users and to apply appropriate guidelines to protect any identified forest values.	Met. Range of AOC prescriptions included to protect values. LCC report described regular updates to the Committee
Tourism & Recreation	Access management: ensure a reasonably similar level of remoteness, which was used prior to harvest activity. Maintenance of remoteness: to maintain a forested appearance, minimize the negative aspects of forestry and avoid physical disturbances to resource-based tourism values. Noise control: to minimize the disturbance to tourists from noise	Met. AOC prescriptions developed for protection of tourism values. RSA process implemented to aid in AOC development.

Objective		**Auditor Comments**
	created by forest operations and road building.	
Land & Water Based Recreation	Maintain a suitable environment for recreational use of the forest.	Met. Concerns identified in public review process were addressed
Other Commercial Activities	Minimize negative impacts of forest management on other commercial forest activities, such as trapping, bear management and mineral exploration.	Met. AOC prescriptions developed and implemented to minimize negative impacts on other commercial forest activities
Cultural Heritage	To protect cultural heritage values that may be affected by forest management.	Met. Known cultural heritage values protected through AOC prescriptions. AOC prescriptions developed to protect high potential cultural heritage areas
First Nations	Protect natural resource features, land uses and values which are specifically used by, or are of importance to local First Nation communities that may be affected by forest management operations.	Met. AOC protection provided to values identified by three local First Nations and one Aboriginal community. Aboriginal consultation requirements were followed
Provincial Parks and Conservation Reserves	Ensure that due consideration is given to the management plans, goals, objectives and concerns of Provincial Parks and Conservation Reserves in the course of developing and implementing the forest management plan for the Iroquois Falls Forest.	Met. Parks netted out of the forest management area early in the process
Provision of Forest Cover Objective Group		
Marten Habitat	Maintain the level of capable marten habitat and enhance the amount of suitable marten habitat on the Iroquois Falls Forest.	Met. 19 core areas were identified representing 12.1% of the total capable area.
Moose Habitat	Maintain or enhance moose wintering and foraging habitat by protecting critical moose habitat over time and by improving moose habitat quality and quantity in high potential areas of the Iroquois Falls Forest.	Met. AOC protection provided to known moose values. Additional moose habitat elements provided within other parts of the planning process (e.g. winter habitat within marten cores; complimentary components of moose habitat and NDPEG)
Woodland Caribou	Recognize woodland caribou as a local featured species. Maintain woodland caribou habitat and known woodland caribou values within currently known woodland caribou occupancy range and plan for future woodland caribou habitat, where feasible, to ensure that a continuous supply of year-round habitat needs are met at the landscape level which includes contributions from the	Met. Woodland caribou recognized as a featured species; numerous measures developed following MNR direction

Objective		Auditor Comments
	Iroquois Falls Forest.	
Rare Flora, Fauna and Ecosystem	To maintain and protect critical habitat for vulnerable, threatened, and endangered species on the Iroquois Falls Forest.	Met. Measures developed to protect bald eagle and woodland caribou
Featured Species	To maintain and protect critical habitat for featured species on the Iroquois Falls Forest.	Met. Featured species guidelines followed
Water Quality and Fish Habitat	Ensure the protection and maintenance of water quality and fish habitat where forest management activities occur.	Met. AOC prescriptions used to protect water quality and fish habitat
Silviculture Objective Group		
Silviculture Prescriptions	Manage the forest in a manner that is consistent with maintaining and improving the productivity, health, vigor and quality of the forest at a sustainable level while maximizing the efficient use of finite financial resources which will lead the forest to the desired future forest condition. Develop preliminary forest operation prescriptions, which will produce the desired future forest economically and successfully.	Not Met. Budgetary constraints led to significant underachievement of silvicultural targets Silvicultural activities not consistent with renewal intensity profile selected in LTMD Required minimum balance for FRTF not met on March 31 2008, 2009 and 2010 Considerable underperformance in company SEM program which contributed to a number of silvicultural failures, FTG data collected during term indicates poor regeneration success (41%) particularly in SB1, SP1 and SF1 forest units
Productive Forest Area and Forest Productivity	Minimize the loss of productive forest land to roads, landings, slash piles and aggregate extraction. Minimize the amount of productive forest land in the non-productive barren & scattered category. Maximize the amount of productive forest area on the Iroquois Falls Forest.	Not met. Slash is occupying productive forest land B&S area increased by 546 ha during the term. Survey work not carried out due to budgetary shortfalls. No remedial action on existing B&S area undertaken during the term
Natural Regeneration	Recognize the ability of the lowland peat sites within the Iroquois Falls Forest to regenerate naturally. Promote harvest techniques, which encourage the protection of advanced growth (CLAAG) and maximize the implementation of HARP. Develop (fine tune) the stand level parameters for lowland treatments	Met. Advanced growth protected A joint research initiative was undertaken to determine stand level targets for operator training and improved FRI classification

Objective		Auditor Comments
	(CLAAG & HARP), which will lead to an improved FRI classification of lowland black spruce.	
Site Preparation	Determine the suitability of prescribed site preparation treatments by forest unit.	Partially Met. Prescription and implementation of trenching operations suitable to the site conditions effectively creating planting microsites which promote increased seedling survival and growth. Suitable shear blading prescriptions inconsistent based on the site conditions viewed during field audit. Some sites determined to have slash loads which did not warrant aggressive site preparation. Predominant use of Trans-Gesco clam bunk skidders made determination of treated areas difficult. Areas mapped manually without the use of 'Silvitrack' GPS tracking units. No retention of documentation pertaining to post harvest site conditions and reasoning for selected site preparation treatment
Tree Genetics and Seedling Quality	Ensure the preservation of the local tree gene pool.	Met. Careful logging practices promotes black spruce regeneration in peatland areas. Improved seed used for all Sb seedlings and 1/3 of Pj seedlings
Best Management Practices Objective Group		
Best Management Practices	Manage for compliance with all environmental, health and safety laws and regulations in all operating jurisdictions. Maintain the environmental management program that is consistent with best practices and strives to meet or exceed all relevant laws, regulations, policies, guidelines and other requirements. Minimize the negative impacts of all operating activities on the environment. Actively encourage waste reduction, recovery at source and recycling. Dialogue with stakeholders, being sensitive and responsive to concerns of those impacted by forest operations. Place a top priority on the health and physical well being of employees by	Partially Met. Negative impacts of operating activities on the environment not minimized due to curtailment of waste fibre program

Objective		Auditor Comments
	providing a safe working environment and promoting the best work practices. Conform to all applicable requirements of the international standard ISO 14001:1996 and Canadian standard CAN/CSA-Z809: 2002. Measure our progress and periodically assess performance through control and audit processes to ensure continual improvement of Sustainable Forest Management. Participate in research that advances the understanding of forest science and, if applicable, incorporate into best management practices and Sustainable Forest Management.	

Appendix 3 – Compliance with Contractual Obligations –

The following table provides the conditions of SFL No. 542531 for the Iroquois Falls Forest. Each condition is provided on a separate row with comments by the audit team to report on the degree of attainment of the condition.

Licence Condition	Licence Holder Performance
Payment of Forestry Futures and Ontario Crown charges	Partially Met. FFT charges paid on most wood volumes harvested during the audit period however information provided to audit team indicated that as of May 5th 2010, ~$6,000 was in arrears. Outstanding dues since paid
Wood supply commitments, MOAs, sharing arrangements, special conditions	Met- wood available for supply agreements and MOUs. Market downturn and mill closures during term dictated wood movement
Preparation of FMP, AWS and reports; abiding by the FMP, and all other requirements of the FMPM and CFSA	Met. Documents prepared as required
Conduct inventories, surveys, tests and studies; provision and collection of information in accordance with FIM	Met. FTG surveys conducted during the terms done in accordance to FIM
Wasteful practices not to be committed	Met. Good utilization noted in most blocks; particularly in light of small piece sizes in many blocks
Natural disturbance and salvage SFL conditions must be followed	Met. No significant natural disturbances
Protection of the licence area from pest damage, participation in pest control programs	Met. No eligible pest management program occurred during the audit term
Withdrawals from licence area	No compensation received or required for OLL lands removed from licence
Audit action plan and status report	Partially Met. Final Status Report 16 months late. Three of eight recommendations met, three partially met or ongoing, two not met (slash management and compliance reporting)
Payment of forest renewal charges to Forest Renewal Trust (FRT)	Partially Met. Forest renewal charges paid for majority of the wood volumes harvested during term however FRT information provided to audit team indicated that as of May 5th 2010, ~$41,000 in arrears. Outstanding dues since paid
Forest Renewal Trust eligible silviculture work	Met. Field examination and a subsequent review of company invoices and maps confirmed silviculture work was eligible
Forest Renewal Trust forest renewal charge analysis	Partially Met. The company undertook renewal charge analysis however it did not meet all requirements stipulated in section 12.3 of SFL. Submitted analysis did not include list of eligible silviculture work to be undertaken on areas which have failed to meet silvicultural standards (section 12.3 (b)) Adequate analysis not provided to indicate that sufficient funds were available in the FRT to complete the proposed work and meet required minimum balance (12.3 (e)). MNR did not complete analysis of the silvicultural liability on IFF. Analysis of silvicultural liability to be completed for the newly amalgamated Abitibi River Forest

Licence Condition	Licence Holder Performance
Forest Renewal Trust account minimum balance	Partially Met. Required minimum balance for FRTF not met on March 31 in 2008, 2009 & 2010. Two sub-accounts created for the amalgamated Abitibi River Forest, comprised of two former Tembec/MNR accounts for Smooth Rock Falls Forest and Cochrane Moose River Forest and two former AbiBow accounts for IFF and Nighthawk Forests. Combined account balance of the two sub-accounts currently above minimum balance for Abitibi River Forest. Agreement in place between Tembec and AbiBow acknowledging management of each sub-account and required balance reconciliation prior to April 1, 2012
Silviculture standards and assessment program	Not Met. Implemented silvicultural activities during the audit period not consistent with those outlined in approved Forest Management Plan. Budgetary constrains during last three years of term led to significant underachievement of silvicultural targets FTG survey targets during term underachieved by 50% while significant deficiencies found in the implementation of the company SEM program which led to a number of silvicultural failures related to tending prescriptions. Recommendations addressing company SEM deficiencies and FTG & naturally regeneration survey backlog included in the report FTG data collected during term indicates poor regenerative success (41%) particularly in SB1, SP1 & SF1 forest units. Widespread implementation of careful logging across all FUs is prime contributor to observed silvicultural failures. Recommendations addressing implementation of careful logging on upland sites are included in report
Aboriginal opportunities	Met. AbiBow and MNR communicated regularly with FN communities associated with the Iroquois Falls Forest. Numerous opportunities were provided to FN communities
Preparation of compliance plan	Met. Plans completed as required
Internal compliance prevention/education program	Met. Prevention/education programs implemented
Compliance inspections and reporting; compliance with compliance plan	Partially Met. Inspecting and reporting of compliance was completed as required except that several blocks reported as suspended are overdue (>2 yrs suspended) and suspension reporting often did not contain all required information. Revamping of compliance program in April 2010 removed requirement for suspension reports however, during term of audit, suspension reporting requirement not met
SFL forestry operations on mining claims	Met. Notices sent to claim holders

Appendix 4 – Audit Process

The Independent Forest Audit Process and Protocol (IFAPP) was developed by MNR to provide a comprehensive and consistent method of evaluating forest management activities on Crown land. The IFAPP (2010) states that the purpose of an Independent Forest Audit is to:

a) assess to what extent forest management planning activities comply with the Forest Management Planning Manual (FMPM) and the Crown Forest Sustainability Act (S.O. 1994, c. 25) (CFSA);
b) assess to what extent forest management activities comply with the CFSA and with the forest management plans, the manuals approved under the CFSA and the applicable guides;
c) assess the effectiveness of forest management activities in meeting the forest management objectives set out in the forest management plan, as measured in relation to the criteria established for the audit;
d) compare the forest management activities carried out with those that were planned;
e) assess the effectiveness of any action plans implemented to remedy shortcomings revealed by a previous IFA;
f) review and assess a licensee's compliance with the terms and conditions of the forest resource licence.

The IFAPP is based on eight guiding principles and contains 148 procedures, 136 of which are applicable to the Iroquois Falls Forest. Of that number a further 11 procedures were not audited due to sampling or by exemption under the IFAPP. The audit procedure serves as a framework to provide a structured approach to evaluating whether or not forest management activities meet the requirements governing forestry practices on Crown land in Ontario. The guiding principles are:

1. Commitment
2. Public consultation and Aboriginal involvement
3. Forest management planning
4. Plan assessment and implementation
5. System support
6. Monitoring
7. Achievement of management objectives and forest sustainability
8. Contractual obligations

MNR categorized the various IFA procedures based on complexity and their potential impact on forest sustainability. The IFAPP directs the audit team to assess through sampling, per audit principle and associated criteria, the three categories of procedures as follows:

- Administrative procedures – low (L) risk: 20-30% of L procedures to be assessed
- Administrative but also having a bearing on sustainable forest management – medium (M) risk: 50-75% of M procedures to be assessed
- Procedures directly related to sustainable forest management – high (H) risk: 100% of H procedures to be assessed

The lower range of the sample scale may be considered for forests certified in accordance with a sustainable forest management standard accepted by Ontario. The following table summarizes the number of procedures selected by the audit team for audit based on the direction provided by the IFAPP.

Table 4-1: Summary of the number of procedures selected by the audit team for audit based on direction provided in the IFAPP.

Principle	Procedures Audited by Risk Category							Comments
	Low Risk			Medium Risk			High Risk	
	Applicable (#)	Selected (#)	% Audited	Applicable (#)	Selected (#)	% Audited	Audited (#) (100% of applicable audited)	
1. Commitment	0	0	-	0	0	0	0	
2. Public Consultation and Aboriginal Involvement	0	0	-	6	5	83	2	
3. Forest Management Planning	6	3	50	12	9	75	41	Applicable procedures *not* audited: 3.2.2.1, 3.5.1.3, 3.6.1.1, 3.6.2.1, 3.6.2.2, 3.7.1, 3.10.2.1
4. Plan Assessment & Implementation	1	1	100	1	1	100	9	
5. System Support	0	0	-	1	1	100	1	Applicable procedure *not* audited: 5.1.1
6. Monitoring	0	0	-	7	4	57	11	Applicable procedures *not* audited: 6.4.2, 6.4.3, 6.5.4
7. Achievement of Management Objectives and Forest Sustainability	0	0	-	2	1	50	15	Applicable procedure *not* audited: 7.1.7
8. Contractual Obligations	0	0	-	0	3	100	18	
Totals	7	4		29	24		97	

The audit process for the Forest consisted of eight main components:

1. Audit Plan: KBM prepared an audit plan that described the schedule of audit activities, audit team members and their qualifications, audit participants, and auditing methods. The audit plan was submitted to MNR, Tembec, AbiBow, FRMG, the Forestry Futures Trust Fund Committee, and the Chairs of the Cochrane, Kirkland Lake and Timmins LCCs.

2. Public Consultation: Several means of engaging consultation for the audit were used. Utilizing the MNR Cochrane District mailing list, KBM mailed letters to numerous parties advising of the audit and inviting their input. Mail-outs included a one-page survey to solicit public input to the audit process. The survey was also available to the general public on the KBM website (www.kbm.on.ca). Newspaper ads were published in six area newspapers prior to the pre-audit meeting advising the public of the upcoming audit, identifying the purpose of the audit and inviting the public to submit comments to the LCC Chair or directly to KBM.

3. Aboriginal Engagement: All seven First Nation groups associated with the amalgamated forest were contacted firstly by mail, then by phone. Personal interviews were arranged with representatives of Beaverhouse and Wahgoshig and telephone interviews were conducted with representatives of Matachewan and Flying Post. Attempts were made to interview Moose Cree, Taykwa Tagamou and Mattagami but these were unsuccessful. The Cochrane

District Manager, MNR Aboriginal Liaison Officers and company staff were also interviewed regarding Aboriginal involvement.

4. Field Site Selection: The audit team conducted a preliminary site selection prior to meeting with Tembec, FRMG and MNR staff. GIS records, Annual Work Schedules and Annual Reports were used to determine the amount and type of forest operations carried out on the Forest during the audit period. A representative sample of sites was then selected to ensure field auditing of a cross section of all activities conducted on the Forest during the audit period. A pre-audit teleconference between MNR, Tembec, AbiBow (for the IFF), FRMG and KBM was held on August 19, 2010. Part of the pre-audit meeting was spent discussing the preliminary site selection and preparation of field packages with the companies and MNR.

5. Pre-audit Document Review: Prior to the September site visit, the audit team reviewed documents provided by AbiBow, FRMG and MNR, including the:
    a) IFF 2005-10 FMP
    b) 2010-12 CP for the Cochrane Area Forest
    c) Annual Work Schedules and Annual Reports associated with the 2005-10 FMP Comparison and Trend Analysis of Planned versus Actual Forest Operations Report (TAR)
    d) IFF Independent Forest Audit 2000-05 report
    e) IFF 2000-05 Independent Forest Audit Action Plan and Audit Action Plan Status Report.

    The audit team also developed a questionnaire that was circulated to planning team members and other AbiBow and MNR District staff prior to the on-site audit to assess their perceptions regarding the effectiveness of specific components of forest management on the IFF. The results of the survey provided additional focus to IFAPP prescribed interview procedures that occurred on site.

6. On-Site Audit: The objectives of the field site visits were to confirm that activities were conducted according to plan, that they conformed to Provincial laws, regulations, and guidelines, and that they were effective. The opening meeting was held in Cochrane on September 13, 2010. During the on-site visit portion of this audit, the audit team spoke with staff of AbiBow, FRMG, MNR, and LCC members. The audit team examined documents, records and maps at the MNR Cochrane District office, and spent two days in the field viewing selected sites. Representatives of AbiBow, FRMG, MNR Cochrane District, MNR Forests Branch, and a representative of the Forestry Futures Trust Fund Committee accompanied the audit team during a portion of the field audit.

    Many stops provided the opportunity to audit multiple activities such as harvesting, renewal, values protection, etc. The following table presents the actual sampling intensity for each forestry activity examined on the ground as part of the field site visits. Due to access and time constraints, the audit team relied on a helicopter to reach the selected field sites. The helicopter also provided opportunities for overviews of the subject areas, enabling overall examination of target blocks.

Table 4-2: Audit sampling intensity for the Iroquois Falls Forest

Iroquois Falls Forest			
Activity	**Total Area or Number (2005-2010)**	**Sample**	**Sample (%)**
Harvest (ha)	21,725	2,674	12
Clearcut for Natural Regeneration (ha)	18,979	2,112	11
CLAAG (ha)	5,621	608	11
HARP (ha)	1,261	140	11
Site Preparation mechanical (ha)	2,634	352	13
Plant (ha)	10,524	1,153	11
Tend (ha)	13,566	1,365	10
Free-to-Grow (ha)	20.295	2,082	10
Area of Concern Categories (#)	17	5	29
Road Construction (km)	20.7	9.7	47
Road Maintenance (km)	416.5	73.8	17
Specified Procedures Review* (ha)	9,803	1,101	11

7. The closing meeting was held in Cochrane on September 27, 2010. This meeting provided a forum for the audit team to present and discuss preliminary audit findings with Tembec, AbiBow (for the IFF), FRMG, MNR, FFTC and a representative of the Cochrane LCC.

8. Final Report: The audit results are presented in this report following a brief description of the audit process and the forest licence area under review. Within the report the audit team has made recommendations to address instances of non-conformance to a legal and/or policy requirement, or an identified lack of effectiveness in forest management activities. Two Best Practices were also identified for outstanding work.

   Recommendations from this audit must be addressed in an action plan developed by ARFMI and MNR Cochrane District, with input and review by MNR Kirkland Lake and Timmins Districts, and MNR Regional and Forests Branch representatives. MNR Regional and Forests Branch representatives will also develop an action plan to address the recommendations applicable to matters of forest management within the scope of responsibilities of these departments.

Fourteen responses to the public notices and survey were received. Commenter's areas of interest in forest management on the Abitibi River Forest were recreation, conservation, tourism, forest management practices, and Aboriginal rights.

Local Citizens Advisory Committees

Letters were mailed to all current members of the three LCCs on the Abitibi River Forest to notify them of the audit and invite their input. An LCC member attended the preaudit meeting conference call and telephone or in-person interviews were conducted with approximately 10-15% of the LCC members representing all three LCCs. Most had been a member greater than one year, with the majority having served on the LCC for more than four years. Members interviewed represented various stakeholder groups, such as the general public, government, trappers and municipalities. Roles and responsibilities of members were discussed as well as the effectiveness of the group to fulfill the obligations set out in the LCC Terms of Reference. An LCC member attended the closing meeting.

Aboriginal Communities
A letter was mailed to each of the Aboriginal communities on the MNR District contact list inviting them to participate in the audit. The letter explained that their input is welcomed and encouraged them to contact KBM if they wished to participate in the audit or if they required more information before making a decision. Follow-up phone calls were made to further solicit input.

In-person discussions were held with members of Beaverhouse FN and Wahgoshig FN while telephone interviews were conducted with Matachewan FN and Flying Post FN. Both Beaverhouse and Wahgoshig representatives felt the relationship was good with MNR and while the Flying Post representative acknowledged they did not really have any involvement with forest management on the Abitibi River Forest, they wished to be kept informed. Attempts to interview representatives of Moose Cree FN, Taykwa Tagamou Nation and Mattagami FN were unsuccessful. A letter from the Métis Nation of Ontario was received prior to the audit voicing concern that they were not given the opportunity for a separate consultation process during forest management planning. At present the FMPM does not require a separate process be offered to Métis organizations.

The Cochrane District Manager, MNR Aboriginal Liaison Officers and company staff were also interviewed regarding Aboriginal involvement.

Overlapping Licensees, Contractors and Commitment Holders
All businesses listed in the MNR District mailing list were sent the one-page KBM survey and letter soliciting input to the audit. Interviews were held with two commitment holders.

SFL Holder
During the audit term the Forest was managed under an SFL by AbiBow, however, at the time of the audit, management of the Abitibi River Forest was being transferred to Abitibi River Forest Management Inc. ARFMI is described as a consortium of forest industries, ranging from small independent logging operators to large forest-products producers. It includes former SFL holders, Tembec and AbiBow. Day to day management is contracted to FRMG. Representatives of ARFMI, including AbiBow and Tembec staff, and FRMG participated throughout the audit process. The audit team appreciates ARFMI's and FRMG's efforts in preparing the audit field packages and supporting the audit process.

Ministry of Natural Resources
Interviews were held with Cochrane District staff including the District Manager, Area Supervisor, Area Forester, Area Biologist, Area Technicians and Aboriginal Liaison Officers. MNR District personnel from Cochrane and Timmins Districts also accompanied the audit team during portions of the field audit. The pre-audit meeting and audit opening and closing meetings were attended by MNR District personnel from the three Districts on the Abitibi River Forest. The audit team appreciates the cooperation and assistance provided by MNR Cochrane District staff in preparing the audit field packages and coordinating the field site visits.

One MNR Northeast Region representative participated in the preaudit meeting, portions of the on-site audit and the closing meeting. Two representatives from MNR Forests Branch attended portions of the on-site audit and the Branch was also represented during the pre-audit meeting and closing meeting.

Forestry Futures Trust Fund Committee
Representatives from the Forestry Futures Trust Committee participated in the pre-audit meeting via conference call, two representatives attended portions of the on-site audit, and one representative attended the closing meeting via conference call.

Appendix 5 – List of Acronyms

ACOP	Annual Compliance Operating Plan
AOC	Area of Concern
AR	Annual Report
ARFMI	Abitibi River Forest Management Inc.
AWS	Annual Work Schedule
CLAAG	Careful Logging Around Advanced Growth
CFSA	Crown Forest Sustainability Act
CP	Contingency Plan
CSA	Canadian Standards Association
Dbh	Diameter at Breast Height
EMS	Environmental Management System
EP(EMSLA)	Environmental Professional (Environmental Management System Lead Auditor)
FFTC	Forestry Futures Trust Fund Committee
FMP	Forest Management Plan
FMPM	Forest Management Planning Manual
FOIP	Forest Operations Information Program
FOP	Forest Operations Prescription
FRI	Forest Resource Inventory
FRMG	First Resource Management Group
FRTF	Forest Renewal Trust Fund
FTG	Free-to-Grow
GIS	Geographic Information System
HARP	Harvesting with Advanced Regeneration Protection
IFA	Independent Forest Audit
IFAPP	Independent Forest Audit Process and Protocol
IFF	Iroquois Falls Forest
KBM	KBM Forestry Consultants
LCC	Local Citizens Committee
LTMD	Long term management direction
MNR	Ministry of Natural Resources
MOA	Memorandum of Agreement
MOE	Ministry of Environment
NSR	Not Satisfactorily Regenerated
RCCIM	Regional Community Constellation Impact Model
R.P.F.	Registered Professional Forester
RSA	Resource Stewardship Agreement
SEM	Silvicultural Effectiveness Monitoring
SEIM	Socio-Economic Impact Model
SFL	Sustainable Forest Licence
SFMM	Strategic Forest Management Model
SGR	Silviculture Ground Rule
SIP	Site Preparation
SMA	Selected Management Alternative
IFF	Iroquois Falls Forest
TAR	Comparison and Trend Analysis of Planned vs. Actual Forest Operations Report

Appendix 6 – Audit Team Members and Qualifications

Name/Role	Mr. Rod Seabrook • Lead Auditor • Public Consultation
Responsibilities	Overall audit coordination and oversight of activities of the audit team; including public consultation; lead the assessment of achievement of management objectives, forest sustainability and contractual obligations.
Credentials	M.Sc. Biology; EP(EMSLA); 30 years forestry experience in Ontario; principal area of practice is forest management and environmental auditing; accredited by the Canadian Environmental Certification Approvals Board as an Environmental Professional specialized as an Environmental Management Systems Lead Auditor with a focus in Sustainable Forestry Management; member of the Auditing Association of Canada; Associate member of the Ontario Professional Foresters Association; eleven years of auditing experience; participated in over 20 Independent Forest Audits for the Province of Ontario. IFA experience covers all Crown managed forest types in Ontario; conducted sustainable forest management audits under the various recognized sustainable forest management standards in Alberta, Saskatchewan, Manitoba, Ontario, New Brunswick, Minnesota, South Carolina, Georgia, Mississippi, Alabama, and Texas; participated in over 100 3rd party audits to ISO 14001, CSA Z809, SFIS, FSC, and Chain of Custody standards.
Name/Role	Mr. Peter Higgelke • Wildlife/Ecology/Planning
Responsibilities	Inspect AOC documentation and practices; audit aspects of forest management related to environmental protection and wildlife practices; review access management program; review aspects of planning; assess achievement of management objectives, forest sustainability and contractual obligations
Credentials	R.P.F., M.Sc.F.; 29 years forestry experience in Ontario, Quebec, and Germany; served on one FMA Review and 16 IFAs, under a range of audit roles including Lead, Harvesting, Silviculture, Wildlife and Planning Auditor as well as auditing under FSC, including three forest management certification audits, three forest management scoping audits, six forest management surveillance audits and one chain-of-custody audit; completed ISO 14001 EMS Lead Auditor training through the Quality Management Institute in April 2006. Extensive knowledge and experience with wildlife and forest management as well as Aboriginal communities; interim plan author for the Lake Nipigon Forest 2010-20 FMP; primary areas of practice and disciplinary expertise are forest management, application development for the use of GIS technology in forest management, the integration of timber management and wildlife values, public participation in forest management planning, and participation by Aboriginal communities in forest management.
Name/Role	Mr. Laird Van Damme • Planning
Responsibilities	Assess adherence to forest management planning requirements; assess compliance and monitoring programs; assess achievement of management objectives, forest sustainability and contractual obligations
Credentials	R.P.F., M.Sc.F.; 23 years experience as a practising forester, educator and consultant; primary areas of practice are in the disciplines of silviculture, forest management and forest research; completed ISO 14001 EMS Lead Auditor training course through the Quality Management Institute; served as a forestry auditor on 14 previous IFAs and several certification audits; Lead

	Auditor on two IFAs; led the Model Forest Program evaluation and the last National Forest Strategy evaluation; authored four FMPs and published numerous scientific and professional papers as an adjunct professor at Lakehead University; consultant to the government of Saskatchewan on forest management planning standards and landscape planning projects in Alberta; peer reviewer of forest management plans and certification audits.
Name/Role	Mr. Brad Chaulk • Harvesting
Responsibilities	Assess harvest planning and operations, compliance and monitoring programs; assess achievement of management objectives, forest sustainability and contractual obligations.
Credentials	R.P.F., H.B.Sc.F.; 17 years of forestry experience; areas of particular experience include silvicultural practices and inventory systems including project management; diverse experiences as a tree plant supervisor, head of propagation and seedbed foreman at one of Ontario's largest nurseries, and as the supervisor and manager of technical services at KBM; member on 14 IFA teams; prepared pre-harvest and post-harvest forest operating prescriptions and developed preferred harvest strategies, site preparation techniques, and planting/tending regimes for individual harvest blocks; completed Managed Forest Tax Incentive Program plans for private landowners; conducted and written wood supply reports/timber analyses; considerable experience using the Forest Ecosite Classification systems for both Northwestern and Northeastern Ontario as well as the new Harmonized Ecosite Classification System for the Province; co-author Field Guide to Second Generation Progeny Test Establishment, Management and Assessment; plan author for the Black Sturgeon Forest 2006-2026 FMP; lead author of the Silvicultural Ground Rules for the Dog River-Matawin 2005-2025 FMP; project manager for both the Lake Nipigon Forest 2010-20 FMP and the English River Forest 2009-2019 FMP; certified to interpret aerial photography in Ontario's Boreal Forest; taught forest management planning at Confederation College.
Name/Role	Mr. Stephane Audet • Silviculture
Responsibilities	Assess renewal, tending and protection planning and implementation as well as silviculture monitoring, achievement of management objectives, forest sustainability and contractual obligations.
Credentials	R.P.F., with ten years of experience in the forestry sector. Primary focus on silviculture through managing site preparation activities, conducting forest inventory, regeneration and FTG surveys, tree improvement activities, cut block and road layout; contributed to a number of forestry consulting projects including wood supply analyses, customized operational costing matrices and wood supply contracting; silviculture auditor on the 2009 Trout Lake IFA.
Name/Role	Mr. Keith Hautala • Modelling
Responsibilities	Review SFMM strategic planning; assist in assessment of achievement of management objectives and forest sustainability.
Credentials	M.Sc.F.; 11 years of forestry experience in Ontario with an emphasis on long-term forest management planning, wildlife habitat analysis, strategic-level forest modelling, and forest auditing; participated in six IFAs in the position of Forest Modelling Auditor and an additional four as Secretariat; auditing responsibilities included reviewing assumptions, composition, and documentation of long-term strategic models, examining development and evaluation of management alternatives, and assessing achievement of management objectives and forest sustainability; teaches plant biology and

	wildlife courses at Confederation College.
Name/Role	Ms. Mary Anne Seabrook - Aboriginal Involvement
Responsibilities	Aboriginal involvement in forest management planning.
Credentials	Business Diploma. Ojibway descent; member of Red Rock Indian Band, located east of Thunder Bay. Strong background of working with First Nations organizations including the Ontario Metis and Aboriginal Association, the Red Rock Indian Band, Meno Bimahdizzewin Child and Family Service; served on Board of Directors for Native People of Thunder Bay Development Corporation; served as the team secretary on the Red Rock Indian Band Hydro Negotiating Team; involved in interviewing Michipicoten First Nation members to assess their skills and training requirements against work experience required for apprenticeship trades. Auditor on both IFA and FSC audit teams covering a total of seven audits.
Name/Role	Ms. Caleigh Sinclair - Audit Secretariat
Responsibilities	Provide general support in the execution of the IFA including logistics, evidence gathering, and report development. Assists in review of public consultation procedures and preparation of audit reports.
Credentials	H.BSc Biology; worked on a sea lamprey control program, as a resource technician, assistant planning biologist, acting planning biologist and renewable energy coordinator for the Ontario Ministry of Natural Resources. Currently main area of focus with KBM is renewable energy and environmental assessment projects.

Appendix 7 – Comparison and Trend Analysis Report

Comparison and Trend Analysis of Planned Versus Actual Forest Operations Report

for the

2010 Independent Forest Audit of the Iroquois Falls Forest SFL# 542531 Cochrane (Kirkland Lake) District, Northeast Region

1570
P. D. FANTIN

Prepared by:
Paul Fantin, R.P.F.
Forest Program Manager
First Resource Management Group
(Acting as agent for Abitibi River Forest Management Inc.)

Date: August 19, 2010

ABITIBI RIVER
Forest Management Inc

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Introduction

This report was prepared as part of the 2010 Independent Forest Audit of the Iroquois Falls Forest for the April 1, 2005 to March 31, 2010 audit term. The purpose is to provide an interpretation of the current state of the Iroquois Falls Forest relative to its historical state.

As of April 1st, 2010 the Iroquois Falls Forest was amalgamated with the Nighthawk Forest, the Smooth Rock Falls Forest and the Cochrane Moose Crown Management Unit into one forest area named the Abitibi River Forest. As such, the 2010 IFA will be the last audit of the Iroquois Falls Forest. At the time of this report preparation the SFL for the new amalgamated forest was being issued to Abitibi River Forest Management Inc. (ARFMI), a new cooperative based management company comprised of forest industry producers, forest harvesting companies and First Nations. The management of this SFL area is being carried out by First Resource Management Group (FRMG) under contract to ARFMI.

The current and past Forest Management Plans (FMPs) and the past Timber Management Plans (TMPs), the Forest Resource Inventory (FRI), the Report of Past Forest Operations (RPFO), the Annual Reports (AR) and the forest planning system have contributed to the preparation of this Trends Analysis Report.

Management Unit Description and History

The Abitibi Paper Mill was constructed between 1912 and 1915. Abitibi has had licenses to harvest wood since that time. Forest operations have, therefore, taken place on the Iroquois Falls Forest for 95 years.

On April 14, 1999, a sustainable forest licence was approved by order-in-council and SFL# 542531 was issued to Abitibi-Consolidated Inc. This new license encompassed what was previously known as the Iroquois Falls Forest FMA and the Iroquois Falls South Company Management Unit. Subsequently, Abitibi-Consolidated became known as AbitibiBowater.

The Iroquois Falls Forest is located in the Northeast Region of the Ontario Ministry of Natural Resources. Approximately eighty per cent of the forest is within the administrative District of Cochrane and twenty per cent is within the administrative District of Kirkland Lake. Cochrane District is the lead administrative district for the IFF although Kirkland Lake District has direct input into the planning and administrative responsibilities for those areas within that district.

The IFF is comprised of parts or all of 149 Ontario Base Maps (OBM), each base map being 10 kilometres by 10 kilometres. Figure 1 on the following page depicts the IFF in relation to the MNR districts and the Northeast Administrative Region as well as within the newly amalgamated Abitibi River Forest. The AbitibiBowater Mill and the Woodlands office are located in Iroquois Falls. AbitibiBowater administered the Iroquois Falls Forest from the Iroquois Falls Woodlands office until January, 2010 when FRMG assumed the management responsibilities for the landbase. The location of the Company office, Iroquois Falls and the FRMG office are illustrated on Figure 1.

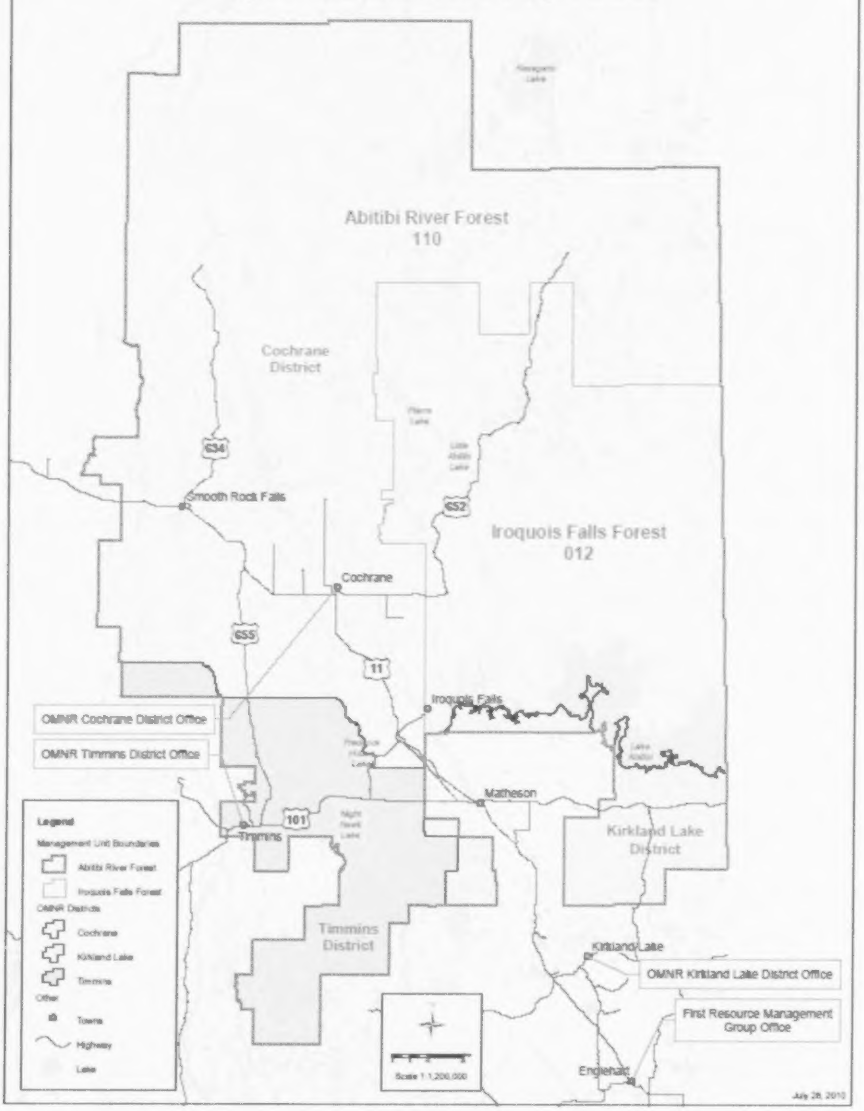

Figure 1 - Iroquois Falls Forest Management Unit

Abitibi River Forest
110
Cochrane
District
Iroquois Falls Forest
012
634
Smooth Rock Falls
652
Cochrane
655
11
Iroquois Falls
OMNR Cochrane District Office
OMNR Timmins District Office
Matheson
101
Timmins
Kirkland Lake
District
Timmins
District
Kirkland Lake
OMNR Kirkland Lake District Office
First Resource Management
Group Office
Englehart
Legend
Management Unit Boundaries
Abitibi River Forest
Iroquois Falls Forest
OMNR Districts
Cochrane
Kirkland Lake
Timmins
Other
Towns
Highway
Lake
Scale 1:1,200,000
July 28, 2010

Current and Past Forest Management Plans: This trend analysis report documents three past management plans and four years of the current forest management plan as follows:

Figure 2: Plan Terms on the Iroquois Falls Forest

	Plan Term: IFN	Plan Term: IFS
Current 5-year FMP	2005 to 2009	2005-2009
Previous 5-year FMP	2000 to 2005	2000 to 2005
Previous 5-year TMP	1995 to 2000	1996 to 2000 (4-years only)
Previous 5-year TMP	1990 to 1995	1991 to 1996

Current plan: 2005 to 2010 Forest Management Plan: This plan covers the 2005-2010 five year operating term and was prepared using the 1996 FMPM. The plan was prepared using the 1989 FRI and 1986 photography updated with depletion and accrual data. The SFMM wood supply model was used. Due to the timing of the audit, annual report data was not available for the 2009-2010 period therefore the information presented is for the first four years of the FMP. The SFMM wood supply model was used.

Past plan: 2000 to 2020 Forest Management Plan: This plan covers the 2000 to 2005 five year operating term and includes the SFL 542531 (IFN and IFS). This plan was prepared under the1996 Forest Management Planning Manual by Abitibi-Consolidated using 1989 FRI and 1986 photography. Significant changes in forest typing occurred for this management period. Extensive "Barren and Scattered" area surveys had been carried out between 1990 and 1999. Much of the B&S was re-classified as productive forest. The SFMM wood supply model was used.

Past plan: 1995 to 2015 TMP covering the 1995 to 2000 five year operating term for the original FMA 500200 (IFN): This plan was prepared by Abitibi-Consolidated using the 1986 TMP manual, the 1989 Forest Resource Inventory (FRI), and 1986 photos. The FRI was updated to account for depletions and renewal. In this plan, the maximum allowable depletion (MAD) calculations were done using the area regulation model MADCALC (version 5.0.0) and a volumetric analysis using the volumetric regulation model FORMAN 2.1. The MADCALC program was also used to verify the chosen NORMAN model scenario. This plan was fully implemented by Abitibi-Consolidated for the five-year term from 1995 to 2000.

Past plan: 1996 to 2016 TMP covering the 1996 to 2000 four year operating term for the Iroquois Falls South Company Management Plan: This plan was also prepared by Abitibi-Consolidated using the 1986 TMP manual, the 1989 Forest Resource Inventory (FRI), and 1986 photos. The FRI was updated to account for depletions and renewal. In this plan, the maximum allowable depletion (MAD) calculations were done using the volumetric regulation model FORMAN 2.1. In addition, the output of the FORMAN model was verified using an early version of the Strategic Forest Management Model (SFMM). This plan was written by Abitibi-Consolidated (Abitibi-Price) but was implemented by Malette Inc. which bought the Kirkland Lake Sawmill of Norbord (Normick Perron), which had overlapping licenses with Abitibi for the four year period from 1996 to 2000. MNR conducted all surveys, renewal and maintenance work during 1996 but subsequently as MNR was phasing out its operations, Malette and Abitibi took on survey and renewal and maintenance responsibilities although they did not possess the legal right or responsibility to do so at the time.

The Iroquois Fall South Company Management Unit became part of the Iroquois Falls Forest SFL as the Iroquois Falls South Forest on April 14, 1999. Initially, this plan was to have a five year term to 2001 but on April 1, 2000 the unit was amalgamated into the Iroquois Falls Forest and as a result, the term was shortened to four years.

Past plan: 1990 to 2010 TMP covering the 1990 to 1995 five-year operating term for the original FMA 500200 (IFN): This plan was prepared by Abitibi-Consolidated (Abitibi-Price) using the 1986 TMP manual and the 1989 FRI. Wood supply calculations were done using Madcalc 3.0.3 and the OWOSFOP model, an area based simulation model. The seven forest units defined for this plan were based on working groups. This plan was written and fully implemented for the five-year term from 1990 to 1995 by Abitibi-Consolidated. Final versions of the RPFO tables were available for this period in the Report of Past Forest Operations for the Iroquois Falls Forest.

Past plan: 1991 to 2011 TMP covering the 1991 to 1996 five-year operating term for the Iroquois Falls South (IFS) Company Management Plan: This plan was prepared by Abitibi-Consolidated (Abitibi-Price) using the 1986 TMP manual and the 1989 FRI. Wood supply calculations were done exclusively using Madcalc 3.0.3, an area based simulation model. Acceleration factors were required to be used to remove an excess of over mature timber. The six forest units defined for this plan were based mostly on working groups with a split by site class in the spruce working group. Larch and cedar were grouped in with balsam fir and balsam poplar was grouped in with aspen poplar. This plan was written by Abitibi-Consolidated (Abitibi-Price) but was implemented by Normick Perron Inc., which had overlapping licenses with Abitibi for the five year period from 1991 to 1996. MNR conducted all surveys, renewal and maintenance work during this time period. Preliminary RPFO tables appear in the 1996-2016 TMP but final versions were not created until February 2000.

The Iroquois Falls Forest (IFF) contains a total land base of 1,168,077 hectares including water, non-forested land and productive forest land and patent land. The major portion of the Iroquois Falls Forest lies within the physiographic section of the Boreal Forest known as the Great Northern Clay Belt. The most northerly is situated on the James Bay coastal plain and that part of the forest south of Lake Abitibi is within the Central Transition Zone. Soils in the Iroquois Falls Forest are the result of glacial and post-glacial events. The clay soils have been derived from sediments deposited by post-glacial Lake Barlow-Ojibway. Peat and organic soils, overlying the marine sands and clays, resulted from the deposition of vegetative matter in association with poorly drained land. Most of the Unit is gently rolling and poorly drained. The clay surface is broken in places by low knolls and ridges consisting of older glacial and glacial fluvial deposits (i.e. north-to-south trending eskers and esker complexes, kames and drumlins). Stream and gully dissected clay plains, occasional bedrock outcrops and extensive swamps and bogs also provide variation to the landscape. An outstanding example of a jack pine covered esker is the Munro system which extends from north of Lake Abitibi south for a distance of over 100 kilometres.

The Forest is characterized by stretches of stands of black spruce on gently rising uplands or on lowland flats. On the lowland flats, black spruce alternates with extensive sedge fens and sphagnum bogs. Hardwood or mixed wood stands of trembling aspen, balsam poplar, balsam fir and white and black spruce are found on better drained sites. Jack pine is found on drier sites such as outwash deposits, old beaches and eskers. White birch is prominent on sandy soils.

The majority of the Iroquois Falls Forest is drained by one major watershed: The Lake Abitibi - Abitibi River system. The Abitibi River system eventually flows into the Moose River and ultimately into James Bay at Moosonee. A very small corner of the southern portion of the Iroquois Falls Forest drains southward into the Great Lakes system.

4.1 Implementation of Forest Operations - Trend Analysis

4.1.1 Harvest Area

For ease of comparison, Table AR-7 has combined the previous data for the Iroquois Falls North (previous to FMP 2000 this was FMA 500200, Iroquois Falls Forest) and the Iroquois Falls South (previous to FMP 2000, this was the Iroquois Falls South Company License).

The planned and actual harvest area figures reported in Table AR-7 were based on the RPFO Table 4.1, RPFO-1, or Table 4.15 for the 1990-1995 and 1995-2000 periods. The 2000 and 2005 planned figures were based on FMP-18, while the actual harvest and natural depletion areas were based on annual report data.

Both the 1990 and 1995 TMPs used forest units based on working group and site class.

There were three spruce forest units: Sp1, Sp2 and Spr3 which attempted to separate the spruce upland, spruce slope and spruce lowland spruce sites. The balsam fir working group included the B forest unit and the small amount of other conifer (cedar and tamarack). The entire poplar working group was included in the Po forest unit, all birch in Bw forest unit and jack pine in Pj forest unit. In the 2000 FMP the forest units increased in complexity and moved from simple working group and site class amalgamations to complex groupings based on working groups, species composition and site class. This increased the forest units to twelve. The biggest change was the classification of stands into pure, mixedwood, and incidental forest units based on species composition. Pure forest units included popur (poplar), bwpur (birch), sbloc (spruce lowland CLAAG), sbloh (spruce lowland HARP), spupl (spruce upland), and pjpur (jackpine), while mixedwood forest units included sphmx (spruce hardwood mixed), pjmix (jack pine mixed), bfpmx (balsam fir pure and mixed), bwmix (white birch mixed), pomix (poplar mixed) and othco (cedar and larch). For the 2005 FMP further refinement occurred with the adoption of forest units based on the suite of northeast regional standardized forest units. This allowed classification of sites based to include forest cover types that could also be more closely compared to wildlife habitat types and ecosite classification.

Table AR-7 indicates the approximate grouping of the current forest units into the past plan forest units for comparison purposes. Since the forest units have changed between plans since 1990 it is difficult to make individual forest unit comparisons and establish meaningful trends. It does appear that historically the more conifer –based forest units were better utilized than the hardwood forest units. This trend has been decreasing in recent years with the establishment of markets for hardwood OSB fibre. There has been some variation in planned total harvest area over time. Planned total area depletions from 1990 to 2000 increased by 1,461.6 ha annually or 19.1%. For the 2005 FMP the planned depletion area decreased by 12.8% (i.e. 1,168.4 ha annually) from the 2000 FMP level and overall represents an increase of 293.2 ha per year (3.8%) over 1990 TMP levels.

The actual depleted area ranged from 101.5% of planned in TMP 1990 to 87.8% in TMP 1995 to 74.3% in FMP 2000. During the first three years of the 1995 plan term, the market was good for both newsprint and lumber and operations were at normal levels. A prolonged labour dispute at Abitibi-Consolidated resulted in reduced harvest activities for a good portion of the operating year. In the final year of the plan, operations returned to normal levels but a mild winter and an early spring affected operations during the winter months. Two factors largely reduced the amount of poplar harvested during this period. Demand for OSB was low, especially in the first years of the plan term. Norbord operations were also affected during the first three years of the plan by the Cochrane District Remote Tourism Strategy. Planned poplar operations in the Two Peak area were delayed pending the finalization of the strategy and the development of a harvest plan, which was suitable to the remote tourist operator in the area. During year one of the 2000-2005 plan term, First

Nation blockades prevented operations on most of Iroquois Falls (North) for a period of six months. Other sources of wood fibre had to be tapped during this period. A second First Nation concern in the northeast corner of the Forest prevented Tembec from operating their overlapping license for the first two years of the plan term. During year three, the Tembec sawmill in Cochrane was shut down for a minimum of four months while mill upgrading took place. Some of these situations resulted in a permanent reduction in wood use.

For the 2005 FMP the actual harvest figures are annualized but only represent four of the five years. After four years, the annualized harvest is 65.6% of planned. The underharvest is apparent across all of the forest units and can be attributed to poor markets for softwood lumber, pulp and paper, oriented strand board and hardwood plywood as a result of the recent global economic recession spurred by the collapse of the housing market in the United States and to a lesser extent Canada. Contributing to this was the countervailing duty applied to softwood lumber as well as the increase in the value of the Canadian dollar against the American currency making exports to the United States less attractive. In addition, high fuel and electricity costs and insurance premiums all conspired to increase production costs at a time when prices for forest products were in steep decline. Finally, in an attempt to minimize operational costs, some companies focused on sourcing fibre as close to the mill as possible in order to reduce haul costs thereby leaving more distant areas unharvested. Throughout this period the facilities in Cochrane, Timmins, Englehart as well as smaller mills all took operational downtime due to the lack of markets for their products. While the final 2009-2010 annual report information had not been compiled at the time this trend analysis was completed, it is likely that this trend will persist through to the end of the five-year term.

4.1.2 Harvest Volume

Table AR-8 details planned vs. actual harvest volume. The harvest objective in the 1990 management plan (for the Iroquois Falls Forest north) was to maintain a sustainable and regulated volume of marketable fibre over the period of the plan for the licensee, Abitibi-Price Inc. A second objective proposed increasing the utilization of poplar.

By comparison, the 1995 plan included an objective of maintaining a conifer fibre supply to the Abitibi mill. However, a key difference is the re-direction of round wood to designate sawmills with an equivalent exchange of spruce fibre in the form of chips to the Abitibi mill. At the same time, markets for poplar veneer and poplar OSB were in place.

For the period of 1990 to 2005 the total planned volume increased from 692,955.2 m3/yr to 752,987.4 m3/yr or 8.6%. This modest increase can be attributed primarily to the refinement of yield information and the migration from an area based forest regulation model (MADCALC) to the volumetric Strategic Forest Management Model (SFMM).

During the 1990 - 1995 plan term the actual harvest for conifer was within 92.9% of the planned harvest. The poplar forest unit was lower at 87.3% of planned. During this term, poplar veneer was in demand but demand for poplar wafer board was sporadic which tended to reduce the total poplar target.

During the 1995 - 2000 plan term the actual harvest was 76.3% of the planned for all forest units. The average for conifer forest units was 78.5%. During the first three years of the plan term, the market was good for both newsprint and lumber and operations were at normal levels. As described above, there were labour dispute issues and operational issues that lead to lower than expected utilization. The average actual versus planned for the poplar forest unit was 70.4%. Two factors largely reduced the amount of poplar harvested. Demand for OSB was low, especially in the first years of the plan term. Norbord operations were also affected during the first three years of the plan by the Cochrane District Remote Tourism Strategy. Planned poplar operations in the Two Peak area were delayed pending the finalization of the strategy and the development of a harvest plan, which was suitable to the remote tourist operator in the area. As well, in 1997, the Malette Inc. strandboard plant in Timmins was destroyed by fire and caused an undercut in the following year on the Iroquois Falls South area because there was a surplus of poplar on the market. There was a significant undercut of poplar in the last three years of this forest as well, although one of these years was due to the fact that Tembec did not harvest its full allocation on the unit as a result of commitments on other units.

For the 2000-2005 period the actual harvest volumes were 88.5% and 88.4% respectively for softwoods and hardwoods. The hardwood achievement was largely due to increased utilization of white birch in the OSB process by Grant Forest Products.

For the planning period the planned SPF yields of 62 cubic metres per hectare were 19% lower than actual yields of 74 cubic metres per hectare and the planned poplar and white birch yields of 24 cubic metres per hectare were 17% lower than actual yields of 20 cubic metres per hectare. The planned volumes excluded 13.6% of the poplar volume to account for balsam poplar. As a result, the SPF yields were increased by between 10 to 15%, and the balsam poplar proportions was reduced to 8% in the 2005 FMP to address the yield differences noted above.

For the 2005-2010 period area and volume data is available only for the first four years however the pro-rated data indicates that the actual harvest volumes for conifer are at 79% of planned while total actual hardwood volumes are within 55% of planned. The actual SPF volumes to date are 84 m3/ha compared to the planned yield of 69 m3/ha. For Poplar and birch volumes that actual yield to date has been 21 m3/ha compared to a planned 25 m3/ha. Given the current actual harvest levels detailed in AR-7 with an overall under harvest of area to date compared to planned it appears at this point in the implementation of the 2005 plan that slightly higher than planned recoveries of conifer volumes are being realized while hardwood recoveries are lower than planned. This trend for hardwood is consistent with past planning terms however the past underachievement of conifer volume appears to be improved based on the first four years of data. Final confirmation of this will occur once the 2009-2010 AR is completed and the determination is made whether higher yielding stands were harvested during the prolonged period of economic recession.

4.1.3 Renewal and Maintenance

Table AR-9 provides a summary of planned and actual renewal, tending and protection operations.

Planned and actual renewal and maintenance treatments were derived from the applicable RPFO Table 4.4 or RPFO-7 for the 1990 and 1995 terms while the 2000-2005 and 2005-2010 planned data came from the respective Table FMP-25 and the actuals were derived from annual report data.

During the 1980's, the MNR phased out of operational renewal activities and the company became responsible for renewal according to the new Forest Management Agreement (FMA) on Iroquois Falls North. In contrast the MNR retained responsibility for renewal on Iroquois Falls South until the 2000-2005 plan term.

During the 1980's and into the early 1990's, intensive silviculture was the order of the day, with greater than two-thirds the actual renewal coming from artificial intensive treatments. During this era, there was a program of recovery of barren and scattered areas, which had not previously received silvicultural treatment or treated areas and which had not met minimum standards. Successful herbicide treatments were limited in the early 1980's. By the mid-1980's, glyphosate (Vision) was made available for release of plantations (mid-1980's), which added a very important tool for release of spruce plantations from competition with grasses and raspberries.

The level of artificial renewal has generally declined over time as lower cost natural regeneration alternatives were implemented in the later plan periods (1995 to present). The implementation of eco-system management and the natural disturbance guidelines has contributed to this change in strategy. As well, mechanical harvesting equipment replaced the chain saw and wheeled skidders in the late 1980's. Increasing emphasis has been placed on reducing site disturbance and protecting the advanced regeneration, which is present at harvest.

The actual renewal shortfalls in the three past terms can generally be attributed to the fact that the actual harvest was below planned harvest. The total actual renewal is considered to be approximately equal to the total actual harvest. For the current planning period the annualized figures show a comparable total actual renewal achievement to planned and a continuance in the trend of an increased use of natural regeneration with a corresponding reduction in the use of artificial regeneration treatments. This data still requires the final year of renewal data however the trend is expected to continue to the end of the term.

In all three past terms shown in AR-9, the total actual renewal is lower than the total planned renewal. This is directly related to the lower rate of harvest during each of the three terms. During the 1990-1995 term, the proportion of artificial regeneration maintained a level of 47% of the total regeneration. This represented a continuation of the increased artificial regeneration program of the 1980's, particularly in the old Iroquois Falls North section of the forest where the emphasis during this term and previous terms was to renew the large amounts of back-log areas, which had accumulated over time. For the area south of Lake Abitibi, there was an under achievement of planned artificial regeneration levels due to a change in strategy that allowed more of the hardwood forest types (white birch and poplar) to regenerate naturally as well as the implementation of seed tree systems on the lowland spruce areas and careful logging. At the time, the unit was a company management unit where the regeneration program was funded and managed by the Crown, which was subject to significant fiscal constraints during the early 1990's.

The 1995 FMP and the 2000 FMP reversed the artificial regeneration trend. Generally all back-logged areas had been renewed and the emphasis was on recently harvested areas. The planned split of artificial to natural was approximately one-third to two-thirds. This was considered normal, particularly in the Clay Belt where spruce working groups are represented by a minimum of 50% lowland black spruce, which are conducive to natural regeneration. In the old IFS section of the forest the transition to this proportion of artificial to natural was achieved by the 2000 planning period. In addition, the increased utilization of aspen stands resulted in increased natural regeneration to aspen.

Direct seeding was minor component of the total renewal program for the first three planning periods. Surveys have indicated that direct seeding with black spruce has not appreciably increased the success of areas which otherwise renew naturally.

There are two major forms of site preparation on the Iroquois Falls Forest. Winter shear blade is carried out under frost conditions on all clay and peatland sites to minimize site disturbance while removing slash and competition; and disk trenching takes place on upland sites in the summer to remove thick duff layers for subsequent planting to spruce and jack pine. All of the terms show underachievement of mechanical site preparation ranging from 53.7 % in the 1990-95 period to 41.6% of planned in the current plan period. While some of the underachievement of the planned levels can be accounted by underachievement of harvest area, the majority of the difference can be attributed to the increased emphasis on natural regeneration treatments. The reduction of site preparation had taken place primarily on the spruce sites. The reduction occurred for a number of reasons: the type of harvesting pattern where harvesters use travel corridors essentially prepares these corridors for subsequent planting without further preparation; and in many cases site preparation on upland clay sites resulted in creating severe competition in a different form; namely, grass and raspberry competition.

The aerial herbicide release program consists of releasing naturally regenerating black spruce from competition from alder using 2,4-D and releasing planted trees from competing vegetation using glyphosate. Up to 1990, an expanded program of herbicide was implemented to treat large areas of backlog. The 1990-1995 term proposed a continuing program of catch-up but in reality the proposed treatments were for current programs. The 1990 term reduced the amount of herbicide used to 48.7% of planned. During the next two additional terms, the actual achievement has exceeded planned levels.

For the current planning period the annualized data shows an overall under achievement of silvicultural targets for the five years of operations. The overall trend of utilizing natural regeneration to renew the sites rather than artificial treatments continued into this period. The 2005 FMP target specifies 56% of the renewal area is to be regenerated via natural regeneration, 33% by basic treatments and 11% by intensive artificial means. The achievement for natural regeneration areas has exceeded the target by 25.7%. A corresponding decrease in artificial regeneration of 38.3% below the target is also noted in Table AR-9. Overall the total actual renewal program for the period is approximately 2% below planned target levels. The reliance on natural regeneration treatments in the 2005-2009 period has been primarily due to budget constraints within the company.

Site preparation is also below planned levels with reliance on more natural regeneration versus basic or intensive treatments as the causal factor. In addition, the underachievement of harvest due to the poor economic conditions has contributed to this target achievement level.

Aerial tending treatments are 24% less than that targeted levels. Budget constraints have been the primary reason for these treatment levels. Many of the sites that have been deferred from treatment are lowland spruce sites left to naturally regenerate. As such, these areas are able to hold without a release treatment for 2-3 years with no adverse affect. In the fall of 2010, FRMG is scheduled to complete an aerial survey of all recently regenerated sites. One of the objectives of this project is to establish an inventory of sites requiring silvicultural treatment and to schedule the silvicultural projects to ensure that no areas that require treatment are missed.

It has been AbitibiBowater's practice to fund the annual renewal program costs internally throughout the year and then invoice the FRTF at the end of March for expenses incurred that fiscal year. This practice has historically served the companies purpose's well since annual harvest levels remained relatively predictable from year to year and therefore the FRTF balance was predictable and sufficient to meet the annual costs of the program by March 31st of the fiscal year. With the rapid downturn in the economy and the resulting reduction in harvest levels, and therefore FRTF contributions, the funds required to meet the annual silvicultural program costs were unavailable and has resulted in the current situation of a trust fund balance below minimum balance levels. The overall circumstance was further exacerbated when AbitibiBowater entered Companies Creditors Arrangement Act (CCAA) protection in April 2009. In order to ensure that the minimum balance in the FRTF is recovered an agreement between MNR, AbitibiBowater and Tembec was completed in December 2009. For the period of April 1st 2010 to March 31st, 2012 the ARF will maintain two sub-units and therefore two FRTF sub-accounts. One sub-unit will be comprised of the former Nighthawk and Iroquois Falls Forest land base (i.e. former AbitibiBowater SFL's) and the second sub-unit will be comprised of area from the former Smooth Rock Falls Forest and Cochrane Moose Crown Management Unit. This agreement specifies that for the two sub-units that make up the amalgamated Abitibi River Forest, the total aggregate minimum balance level (i.e. the sum of the minimum balances for each sub-unit) must be met by March 31st of each year. As well, by March 31, 2012 the required minimum balance for the Abitibi sub-unit FRTF account must meet the minimum balance. As there is a balance in the Tembec sub-account that exceeds the minimum balance, it is able to offset the shortfall in the Abitibi Sub-unit account.

4.1.4 Harvest and Regeneration

Table AR-10 provides a summary of harvest and regeneration trends. The harvested area successfully regenerated is a key measure of the forest condition on the Iroquois Falls Forest. Proper completion of this table required silviculture activities, mapping and record keeping systems that maintained individual silviculture records for each particular site harvested. This was not available based on the RPFO information available for the past plan periods as the new requirements were only outlined in the new FMPM in 1996 and were implemented in the 2000-2005 plan. Therefore the analysis of annual harvest areas successfully regenerated was completed as follows.

Table AR-10 reports on the actual regeneration assessments that were completed in each TMP or FMP term, regardless of the year of harvest. These figures are not based on areas harvested during a specific 5-year term.

It is important to note that the year of harvest and the regeneration assessments are not necessarily directly comparable. All figures are reported as annual averages.

The 1990-95 regeneration surveys were based on the 1990-1995 final Table 4.7. The 1995-2000 regeneration surveys were based on the 1995-2000 RPFO-8, and the 2000-2005 regeneration surveys were based on the 2000-2005 AR-7 tables. The reported areas are related to the actual surveys that were completed during the period as opposed to the specific harvest areas during the period.

Table AR-10 indicates that for the 1990 and 1995 periods the area assessed as regenerated has been consistent with the area harvested. Since there is no direct correlation of area regenerated in a specific period vs. area harvested within the same period a longer-term view is required in order to infer any trends from the data. For the recent planning period, survey work was curtailed for 2008 and 2009 due to budget constraints however surveys are planned for the 2010 season with the intent of completing the regeneration survey work previously postponed.

The average annual survey level for the current term and 2000-2005 term is below the average harvest level for the following reasons:

- During the previous two terms (1990-1995 and 1995-2000), harvest allocations were made in the northeast and the northwest of the limit where the percent of lowland black spruce harvest was at a much higher level than previous plans and the FTG period for black spruce peatland is much longer than upland areas (minimum 11 and up to 20 years).
- As described above, budget cutbacks have postponed the survey work. This area will be scheduled for survey during the 2010 season.

The following general trend statements for forest renewal on the IFF are made based on Abitibi's experience in forest renewal since 1980.

- **Logging methods:** the fell-bunch / clam-bunk skid / delimb at roadside logging method produces a cutting pattern of machine travel corridors alternating with no-travel corridors. The result is increased residuals on site after harvest in the no-travel corridors. This results in increased areas of natural regeneration and/or areas of natural plus planting fill-in.
- **Black spruce peatland sites:** renewal by natural regeneration - pure black spruce (stands with >70% black spruce with some component of tamarack and balsam fir). Black spruce peatland sites regenerate successfully to black spruce almost from black spruce advanced growth, black spruce residuals and natural seeding.
    - CLAAG (careful logging around advanced growth) is predicted on up to 80% of lowland sites with a renewal period of up to 12 years.
    - HARP (harvest with regeneration protection) an enhanced method of careful

logging is prescribed for up to 20% of the black spruce peatland sites, results in an instantaneous FTG stand which can gain between 20 and 60 years on a black spruce rotation.

- **Pure poplar:** the preferred treatment is renewal by natural regeneration (>70% poplar). Upland clay sites regenerating by root suckering to pure poplar. Areas, which do not have sufficient natural regeneration will be planted.
- **Pure jack pine**: site prepare and plant to pure jack pine.
- **Spruce upland:** renewal by site preparation, planting and tending. Pure spruce upland artificially renewed to pure spruce upland.
- **Mixed conifer upland and mixed conifer / hardwood:** renewal by natural or site prepare plant and tend. Maintain a mixedwood component.

4.1.5 Forest Condition

Table AR-11 provides a summary of forest conditions for the available managed Crown productive forest for the current plan and the previous three plans. The intent is to evaluate how both the total forest unit area and forest unit age class structure has developed and to draw trends from this data that may be useful in describing the effectiveness of forest management objectives over time. Drawing trends from this information is difficult since the forest units have changed significantly enough since 1990 to preclude a direct comparison between planning periods. Forest units have evolved from those based primarily on FRI working group to forest units that attempted to better describe forest cover condition to the standard suite of regional forest units intended to not only describe forest cover type, but also to classify habitat and eco-type as well. An attempt to aggregate forest units into the pure conifer, pure hardwood and mixedwood categories was made with the intent of ascertaining if there have been noticeable shifts in area between these forest unit groupings. The result of this exercise produced no useable trends and confirmed that the changes to the forest units and the recent level of differentiation of certain forest units have made practical comparisons over time untenable.

For the total productive forest there has been little change since the 1990-1995 period with an initial area of 865,820 ha compared to a plan term end figure of 863,639 ha (-0.25%) which is well within FMP modelling parameters. This positive trend shows that little productive forest is being converted by forest management activities.

4.1.6 Habitat for Species at Risk and Selected Wildlife Species

Data on the habitat for selected species is available from the 2000 and 2005 planning period only. Table AR-12 provides a summary report of the selected wildlife habitat results taken from the 2005 FMP. The 2000 past figures were taken from the 2000 FMP.

Overall the acceptable levels were achieved. Some wildlife species showed a slight reduction in preferred habitat between 2000 and 2005 likely due to harvesting. However, many wildlife species showed largest increases or decreases between 2000 and 2005 that were related to the variance in the forecasting algorithms used between 2000 and 2005. The 2005 FMP was written prior to the 2007 endangered species act. Of the species detailed in AR-12 only the woodland caribou is listed as Threatened. The habitat of this species projected a decline between 2000 and 2005 and based on the current management strategy was projected to slowly decline between 2005 and 2105. A two-year contingency plan was developed for 2010-2012 to allow the implementation of the Caribou Habitat regulation under the Endangered Species Act. At the time of preparation of this report the regulation had not been implemented however the planning team for the 2012 FMP has committed to implement the caribou habitat requirements detailed in the Caribou Conservation Plan, including the development and implementation of a dynamic caribou habitat schedule intended to provide for the habitat of woodland caribou for a period exceeding 100 years.

4.1.7 Monitoring and Assessment

Through the audit period there have been several significant economic events that require discussion. The primary occurrence has been the prolonged economic downturn that was initiated with the collapse of the U.S. housing market and spread internationally into a world-wide recession. This event has lead to significant curtailment of mill production, harvesting activities and associated silvicultural programs on the Iroquois Falls Forest. All major facilities that received wood from the forest had reduced production and/or halted production. AbitibiBowater and Grant Forest Products both entered into Companies' Creditors Arrangement Act (CCAA) protection to allow the companies' time to restructure their respective operations. As referenced earlier in this report, this economic reality has had a significant impact on the implementation of the 2005 FMP particularly with respect to harvest and renewal program target achievement. Associated with the recession has been the closure of the Grant Forest Products OSB mill in Timmins in September 2006 and the periodic, but significant downtime that the Tembec sawmill in Cochrane has taken since 2007. The reduction in harvest resulted in a reduction in contributions leading to issues with maintaining the minimum balance in the Forest Renewal Trust Fund.

All of the insular and peninsular areas were planned for during the FMP planning process for the 2005 Forest Management Plan. For this reason, there were no additional operational NDPEG targets to be met during harvest. The insular and peninsular areas were mapped on the AWS maps and no harvest took place in these areas except for operational roads in a few blocks. When operational roads went through stands, the width of the right-of way was kept to a minimum. In addition to the landscape level planning, 25 stems per hectare were required to remain on site after harvest. This condition was met successfully.

The roads and water crossing monitoring program followed the Roads Strategy as outlined in the FMP. Specific roads receive monitoring yearly and others are monitored every three years. In addition, several Primary and Branch roads receive frequent monitoring when they are used to access operations occurring throughout the year.

Washouts that were potential safety issues discovered during monitoring were flagged to address safety concerns

The use management strategies from the Forest Management Plan were adhered to. When operations occurred on a road, the road was maintained by either the Overlapping Licensee(s) or Abitibi for harvest operations, or Abitibi for silviculture operations.

The 2005 to 2008 annual reports summarize the annual compliance monitoring programs that have been implemented on the forest. The four AR's document a relatively well planned and executed program with no significant instances of non-compliance reported. All of the reported non-compliances were minor in nature with only one deemed to be moderate in 2007. All instances were resolved satisfactorily. The 2008-09 AR provided a summary of compliance activities for the previous five years on the northern portion of the management unit, as well as an assessment of any discernable trends. The identification of significant trends proved to be difficult due to limited operations on the forest however a note was made of an unusual number of occurrences of working without an approval. The final year ten AR will summarize all instances of this non-compliance and report if this has developed into a trend or only a short-term concern. The annual reports detail similar findings for the southern section of the forest with an overall assessment of a solid compliance monitoring program with no discernable trend of non-compliance occurrences.

Exceptions monitoring for the forest has been limited to monitoring osprey nest prescription pre-harvest, during operations and post harvest. In 2007/08 a total of four osprey nests were monitored for occupancy and in 2008 one nest was monitored.

Table AR-13 summarizes the assessment of regeneration and silvicultural success for the forest by forest unit and silvicultural ground rule.

For the BW1 forest unit (pure white birch) only 6% of the total area assessed during the 2005-2008 period was deemed not successfully regenerated. Of the total area successfully regenerated 7.3% regenerated to the SGR projected forest unit while the remainder regenerated to other forest units. Like the Po1 (pure poplar) forest unit, the practice of carefully logging around advanced conifer has lead to the naturally regenerated stands moving towards a more mixed wood condition than the original stand. In addition, the FRI appears to underestimate the conifer component of many of these sites and therefore the original species composition and resulting forest unit classification have been found to be inaccurate.

The MW2 forest unit assessments show that 1% of the total area assessed was found to be not successfully regenerated. The remaining 99% of the assessed area regenerated successfully however the data shows that these sites seldom regenerate back to MW2 forest units and tend to initially transition to more pure hardwood or mixed conifer sites. Again, the careful logging practices tend to favour advanced conifer species such as balsam fir and black and white spruce when present leading to a more mixed conifer condition. When the sites have been treeplanted the end result often is a change to a more pure conifer condition although as these stands age and succession takes place it is expected that a more mixedwood condition will develop.

The Pj1 forest unit represents the pure jack pine forest condition. Pure jack pine is expected to be maintained either by planting or seeding. Only 1.1% of the assessed area was classified as not successfully regenerated. The successfully regenerated area data shows only 9.9% of the area meeting the projected forest unit with the remaining area moving to the PJ2 and SP1 and even to SB3. These particular blocks, which are generally overmature at the time of harvest, have considerable black spruce advanced growth. The result is a mixture of spruce and planted jack pine, which moved the blocks into PJ2 and SP1. Some of the moister sites maintained a larger component of black spruce and moved into SB3.

The PO1 forest unit represents the pure poplar forest unit. Less than 1% of the total survey area was not successfully regenerated. The preferred prescription is to maintain the site as pure aspen. And of the successfully regenerated areas assessed 63.3% regenerated back to the original pure poplar condition. The remainder moved into MW2, PJ2, SP1, SB3 and SF1. The regeneration of pure poplar sites to pure conifer or mixedwood stands is indicative of advanced conifer remaining on the site post-harvest.

The SB1 sites represent the intermediate moist slopes (transition up out of the lowland). A portion of this FU is left for natural but the majority is designated for planting to spruce. These sites are expected to be maintained as spruce. While the majority of the surveyed sites were successfully regenerated (99.8%) only 29% actually remained as SB1. The remainder moved to SB3, SF1, MW2, SP1, and PO1. The movement to SB3 is lower slope within the transition zone. The movement to mixed spruce/fir/pine/poplar is largely attributed to the method of harvest, which tends to leave corridors of residual species, such as, balsam fir and aspen. This trend will continue as long as the harvest method and subsequent silviculture maintains other species.

The SB3 forest unit represents black spruce peatland sites and the forecast is that virtually all of this forest unit (FU) will regenerate as SB3. According to the survey results, 60% of the successfully regenerated sites maintained the SB3 category. The remaining area moved to other forest units, such as, SF1, MW2, SB1, SP1 and PO1. This is an indication that many of these blocks were stratified into more productive sites than the original inventory description. A slight increase in elevation promotes better drainage and more diverse forest units. The majority of the SB3 FU is prescribed for natural regeneration and the presence of other species, such as, balsam fir, pine and poplar exists in the advanced regeneration layer at the time of harvest.

The SF1 forest unit is a spruce/fir forest unit often the result of past disturbance such as logging or spruce budworm infestation. Again, the trend is that the majority of these surveyed areas (i.e. 98.3%) are successfully regenerated however 86.4% of the successfully regenerated areas are not the projected forest unit. These sites are targeted for artificial treatments moving them towards the pure conifer forest units such as SP1 and SB1. As well, poor FRI interpretation of this successional forest unit, combined with careful logging practices tends to move these sites towards a mixedwood condition when left to naturally regenerate.

Of the 19891.8 hectares surveyed in the four year period, approximately 1% was found to be not successfully regenerated. Of the successfully regenerated sites 41.2% of the sites regenerated to the projected forest unit in their respective silvicultural ground rule.

For the development of the 2010 contingency FMP, the Long Term Management Direction summary (Section 3.0) describes how actual forest regeneration results were considered during the development of SFMM inputs.

The starting point for the SFMM post renewal succession rules were the NHF 2008 FMP inputs and the silvicultural effectiveness monitoring data available compiled by the MNR. The post renewal succession rules also considered the actual silviculture program results for the Iroquois Falls Forest. An iterative review and adjustment process was followed to define the final post renewal succession rules. The post renewal succession was identical on the three claybelt forests (i.e. Iroquois Falls Forest, Smooth Rock Falls Forest and the Cochrane Moose River management unit) owing to similar species and forest unit composition of these forests (i.e. mainly lowland black spruce with limited upland conifer, hardwood or mixedwood forest units and very limited cedar, white birch, red and white pine, other hardwood, and jack pine species composition.

The key assumptions were:

- extensive renewal was expected to increase hardwood species compositions based on the initial hardwood composition;
- basic, intensive, and elite renewal was expected to increase the conifer

component through planting in most cases;

- if there was a spray it was expected to reduce or eliminate the hardwood composition and increase the conifer composition
- all renewal was expected to maintain the regeneration treatment intensity, except for failures where hardwood or mixedwoods were expected to be extensive, extensiveW or basic1; and,
- the Bw1 and Mwd basic yield intensities were created through increased conifer composition through planting failures or planted areas not sprayed;
- the extensiveW yield intensity and post renewal was designed to reflect increased hardwood regeneration and composition resulting from winter harvesting of the Po1, Po3, Mwd, and Bw1 forest units which provides nutrient loaded root systems for spring suckering.

For the development of the 2012 Forest Management Plan for the Abitibi River Forest, the planning team will be required to review all of the MNR's silvicultural effectiveness monitoring data in combination with the silvicultural survey results and integrate this data into the post renewal forest succession inputs with associated yield curve adjustments. This will ensure that the future forest model outputs best reflect the expected outcomes of the various silvicultural treatments utilized on the forest.

4.2 Analysis of Forest Disturbances

The year ten Annual Report approved in February 2006 documents the results of the planned and actual forest disturbance implementation and provides a summary of the actual clearcut sizes that were implemented during the 2000-05 period.

The 2000-05 FMP harvest blocks were not organized into planned clearcuts or disturbances so it made it difficult to compare planned versus actual results for each clearcut. The 2000-05 actual disturbances were assessed by taking the actual clearcuts and buffering in and out by 200 metres to define the residual forest and harvested area within each disturbance patch. The results showed a total of 152 of 182 disturbances were distributed to the smaller size classes less than 260 hectares in size. The actual disturbance sizes were very similar to the planned disturbances except it appears more 131-260, less 261-520 and less 2,501-5,000 disturbance patches were implemented. In terms of the CNFER template, the actual disturbance sizes implemented has shown movement towards the natural pattern. The number of smaller disturbances has decreased and there were a few more larger disturbances.

A second summary was provided of the actual 1980 to 2000 and 1985 to 2005 disturbances and the estimated 1985 to 2005 and 1990 to 2010 disturbances for the entire Iroquois Falls

Forest based on disturbance analysis included in the 2000 and 2005 FMPs. The 2005 actual results show a movement between 2000 and 2005 towards the natural disturbance template. The proportion of the largest and smallest disturbances has been reduced towards the template with an increase in the middle disturbance classes, which was also more in line with the natural disturbance distribution.

For the development of the 2010 contingency FMP, the landscape indicators were developed for the entire Abitibi River Forest and not assessed to the sub-management unit level therefore an analysis of harvest and natural disturbances for the Iroquois Falls Forest was not produced. In order to properly assess the objective achievement for the landscape level indicators, all harvest and renewal activities for the plan period must be complete. Partial harvesting in ongoing harvest operations combined with incomplete harvesting data of blocks within a disturbance area significantly alters the results of this analysis and attempting to analyze trends from four years of data would render inaccurate assessments. A complete assessment will be provided in the final year-ten annual report for the 2005-2010 FMP.

For the 2012 FMP for the Abitibi River Forest the implementation of NDPEG will be replaced by the direction in the draft Landscape Guide (science package results) for the forest. The BFOLDS outputs will provide the target achievement ranges for landscape level indicators. In addition, a significant strategic shift in landscape level planning will be implemented with the application of the woodland caribou conservation plan requirements for the forest. The application of a Dynamic Caribou Habitat Schedule will result in the development of relatively large landscape patches designed to enhance long term caribou habitat, rather than to specifically meet natural disturbance template size class targets.

4.3 Analysis of Renewal and Tending Activities

Refer to Section 4.1.3, 4.14 and 4.1.7 for a discussion on the trends in renewal and tending. For the 2000-2005 FMP FRTF expenditures forecast of $14,358,000 ($2,872,000 per year) was very close to the actual expenditure level of $13,286,000 ($2,657,000 per year) indicating the planned silviculture program was implemented. For the 2005-2010 period the total annualized silvicultural expenditures to date (i.e. 2008-2009) is $2,630,750/yr which is 75% of the FMP forecast of $3,446,828/yr. As described previously, this reduced achievement can be attributed to reduced harvesting activity, the reduction in silvicultural expenditures due to budget pressures and the increased implementation of natural regeneration techniques.

4.4 Review of Assumptions in Modelling

The 2010 contingency forest management plan for the amalgamated Abitibi River Forest reviewed and modified assumptions in the modelling for the development of the LTMD (see Section 3.0, pg 2). The review included an analysis of the existing Forest Units and the subsequent development of updated forest units. The data presented in this trend analysis does not provide any evidence that the new forest units are inappropriate or warrant modification. An issue that is not uncommon on forests is the continuous modification and refinement of forest units. This trend has made the comparison between planning periods difficult and often negates the opportunity for the forest manager to extract trends from the data. With the amalgamation of four former management units into on forest, with the application of one set of forest units across a larger area, the issue of forest unit comparisons between planning periods should lessen.

The achievement of harvest volumes over time is detailed in section 4.1.2. Based on refined yield curves since 2000, the underachievement of conifer volumes and hardwood volumes appears to be less than previous terms. The preliminary data from 2005 shows the potential for a modest overachievement of conifer volumes compared to forecast figures however a full analysis of the 5-year harvest will be required to confirm this trend. The data may be a result of targeting higher production stands with above average yield in the earlier years of plan implementation. One of the forest unit/yield curve refinements implemented in the 2010 FMP is the development of two poplar decline forest units to better represent the expected volumes realized from this area. The poplar decline area is a geographically delineated zone subjected to repeated years of forest tent caterpillar infestation resulting in significant volume loses in poplar. The underachievement of aspen volumes in the past period may be partially attributed to this area. The forest unit/yield curves developed for the 2010 FMP involve refinements that, based on the data in this analysis do not warrant further refinement for the 2012 FMP.

Section 4.1.3 provides an analysis of the renewal and maintenance activities for the period. Currently the implementation of the forest management plan indicates an underachievement of artificial renewal treatments and an overachievement of natural treatments. The underachievements of renewal targets are the result of short term budgetary constraints and therefore do not represent a long-term trend. The 2010 contingency FMP appears to have addressed this issue for the entire forest therefore no further refinements of renewal modeling inputs are recommended at this time. In addition, survey work will be undertaken in 2010 to review the regeneration of recent harvest areas and an implementation plan will be developed to schedule any outstanding silvicultural treatments.

Table AR-13 has shown some preliminary indications that the actual achievement of the projected forest unit through the application of a specific silvicultural ground rule and modeled via the post renewal forest succession inputs requires refinement. Although the total area regenerated by Forest Unit is acceptable, the future forest units being created by the treatments do not appear to be meeting projections. Refinements to the SGR projections were made for the 2010 contingency plan however, for the development of the 2012 FMP it is recommended that all current silvicultural effectiveness monitoring data be re-analyzed to ensure that future forest unit projections reflect the survey data.

4.5 Assessment of Objective Achievement

Table AR-14 provides an assessment of objective achievement for the 2005 FMP. Many of the objectives are developed and assessed during the development of an FMP.

Forest Diversity Grouping

The Forest Diversity Group objectives are measurements of area (hectares) of various forest cover classifications. The Forest Unit Area objective measures the area within each Forest Unit to ensure that the forest cover type falls within the bounds of natural variation. This assessment is completed during the development of the FMP, which in 2005 concluded that all forest units are within the bounds. Age class structure objectives (mature and overmature) were set for the 3E1 and 3E6 site region areas within the Iroquois Falls Forest. The indicator for these objectives is the proportion of the area within each forest unit group. As well, a % of total forest cover type grouping target was set and the assessment criteria is that the relative proportions of mature/overmature area be achieved and maintained from T3 onwards. For this reason this target is not measurable after four years of plan implementation.

Social and Economic Group

Wood supply targets were set for each sub unit for SPF and for the entire landbase for Poplar and White birch. The target annual SPF volume (combined sub-units for this assessment) is 569,000 m3/yr. The target volumes for Poplar and White birch are 118,386 m3/yr and 38,600 m3/yr respectively. Table AR-8 shows a combined SPF achievement after four years of 435,173 m3/yr (-24%) and an achievement for Poplar and White birch of 99,912 m3/yr (+7%) and 10,050 m3/yr (-74%) respectively. The increased utilization of poplar can be partially attributed to the Grant Forest Products mill in Englehart maintaining production for most of the recession period to date and their requirement to source poplar for their facility since sources from other forests were curtailed as traditional producers stopped harvesting. The rationale for the under achievement of target area, and the associated volumes has been provided in section 4.1.1. The level of under achievement of these volumes is not unique to the Iroquois Falls Forest and reflects influence beyond the control of the forest manager and the SFL holding company. Once the economy emerges from the recession the utilization of available volume is expected to rise to past levels. In addition, with new non-traditional fibre consuming industries beginning to emerge it is likely that future demand for fibre from the Iroquois Falls Forest will exceed past utilization levels.

In addition to the harvest volume objectives volume harvest levels over time were established. The indicator for these objectives is measured as a % fluctuation in harvest volume for each of the identified sub-units and species/species group between 10 year planning terms. Achievement of these targets occurred at the time of plan development and then will occur every ten years thereafter. To date only 4 years of a 10 year planning term has been implemented therefore these achievements are not assessable at this time.

Silvicultural Objective Group

An objective to ensure that renewal revenues surpass expected expenditures was established in the 2005 FMP. As per the discussion in section 4.1.3, this objective has not been achieved for the plan implementation term as curtailments in silvicultural expenditures were required to match available revenue. This significant underachievement of revenue and expenditures, while challenging in the short term does not represent a long term trend that requires attention in the next FMP. A plan has been established to have the minimum balance level for the Abitibibowater renewal trust account re-established by March 31, 2012 and work is underway by the new cooperative SFL to assess and treat any outstanding harvest area that is no regenerating to FMP standards.

For the objectives developed to maintain both productive forest area as well as total forest area, there has been no change in either of these two indicators during the 2005 term. A target to maintain or reduce total B&S area was measured with a modest increase of 546 ha. The accrual of B&S area will require harvested areas to remain unsatisfactorily regenerated without intervention. The survey work detailed as a strategy for measuring B&S area has not been carried out to planned levels due to budget shortfalls.

Forest Diversity Indicators of Sustainability

The Shannon Weiner Index of Landscape Heterogeneity, Simpsons Index of Landscape Heterogeneity and the Shannon Index of landscape Evenness all have exceed the minimum target levels.

Multiple Benefits to Society Indicators of Sustainability

The managed Crown Forest available for timber production by Forest Unit has shown no significant reductions during the first four years of plan production and all are within the bounds of natural variation. The AHA available to be utilized has a target of 100% utilization of the AHA. To date there has been 66% utilization for all forest units combined with all individual forest units underutilized for the four year period. The under achievement of available harvest area is directly related to current market conditions and is not considered a long-term trend that requires attention in the next FMP. See the discussion regarding wood supply and volume achievements in the Social and Economic Group section.

Forest Cover Indicator Group

The objective for habitat levels for the indicator species is to maintain the total habitat area within the bounds of natural variation. An initial assessment was completed during the development of the 2005 FMP with the intention of meeting the first targeted level of achievement in 2025. After four years of plan implementation, there are no discernable trends to be drawn for this objective achievement.

4.6 Determination of Sustainability

As discussed in Section 4.5 most of the objective achievements are within, or moving towards the desirable levels for the indicators. All forest diversity objectives are either within acceptable ranges or an assessment was not possible since projected timelines for measurement extend beyond the first four years of the 2005 FMP implementation.

The socio-economic indicators for wood supply achievement have been assessed after four years and are not at the desirable levels. The factors that have contributed to this under achievement originate from an economic recession that has extended across all world economies, but particularly the United States which is our primary trading partner for forest products. As the economic cycle changes and the economy recovers it is anticipated that demand for forest products will return. The long-term trend for forest product demand is predicted to continually increase so the recent downturn should have no long-term implications on future volume production or economic sustainability.

Associated with the economic downturn is the failure to meet the silvicultural objective to ensure that forest renewal revenues exceed forest expenditures. It has been Abitibibowater's practice to fund the annual renewal program costs internally throughout the year and then invoice the FRTF at the end of March for expenses incurred that fiscal year. This practice has historically served the companies purpose's well since annual harvest levels remained relatively predictable from year to year and therefore the FRTF balance was predictable and sufficient to meet the annual costs of the program by March

31st of the fiscal year. With the rapid downturn in the economy and the resulting reduction in harvest levels, and therefore FRTF contributions, the funds required to meet the annual silvicultural program costs were unavailable and has resulted in the current situation of a trust fund balance below minimum balance levels. The overall circumstance was further exacerbated when Abitibibowater entered Companies Creditors Arrangement Act (CCAA) protection in April 2009. In order to ensure that the minimum balance in the FRTF is recovered an agreement between MNR, Abitibibowater and Tembec was completed in December 2009. For the period of April 1st 2010 to March 31st, 2012 the ARF will maintain two sub-units and therefore two FRTF sub-accounts. One sub-unit will be comprised of the former Nighthawk and Iroquois Falls Forest landbase (i.e. former Abitibibowater SFL's) and the second sub-unit will be comprised of area from the former Smooth Rock Falls Forest and Cochrane Moose Crown Management Unit. This agreement specifies that for the two sub-units that make up the amalgamated Abitibi River Forest, the total aggregate minimum balance level (i.e. the sum of the minimum balances for each sub-unit) must be met by March 31st of each year. As well, by March 31, 2012 the required minimum balance for the Abitibi sub-unit FRTF account must meet the minimum balance. As there is a balance in the Tembec sub-account that exceeds the minimum balance, it is able to offset the shortfall in the Abitibi Sub-unit account. In addition, Abitibi River Forest Management Inc does not pay silvicultural expenses out from internal funding sources. All expenditures are paid directly from the forest renewal trust fund at the time the expense is incurred. Finally, ARFMI has approved a budget for 2010 to survey all recently harvested areas with the intent of assessing the regeneration of these sites against FMP silvicultural ground rule standards and to develop a schedule for the treatment of all sites that are not meeting regeneration objectives. For these reasons, there are no long-term sustainability issues anticipated from this recent revenue shortfall.

All forest diversity indicators of sustainability are at acceptable levels. The utilization target for the AHA as a "multiple benefits to society" indicator fell short of planned levels for the first four years however the rationale for this underachievement is identical to that described above. The total managed Crown forest available for timber production has been maintained for the planning period as well.

Finally, all wildlife habitat levels, including species at risk have remained above targeted levels for the planning term.

The status report on the implementation of 2005 IFA recommendations was re-submitted in August 2010. The report detailed the progress in addressing each of the recommendations assigned to Abitibibowater or MNR. The majority of actions required to address the 8 audit recommendations have been completed or have started and are classified as ongoing. An issue relative to actioning recommendations 2 and 3 (slash reduction and addressing backlog FTG surveys) has developed due to the reduced harvesting activities and the subsequent reduction in funds deposited into the FRTF. An agreement between Abitibibowater and MNR has been reached to ensure the minimum balance levels have been attained by March 31, 2012. As well, with the amalgamation of the four forests into the new Abitibi River Forest the approved 2010 silvicultural budget includes provision to complete FTG surveys as well as for the survey of recent harvest areas.

Conclusion

Based on the level of objective achievement as described above and the current status of the 2005 independent forest audit action plan, it is concluded that the implementation of planned operations has provided for the long-term sustainability of the Crown forest.

Appendices

MANAGEMENT UNIT NAME: Iroquois Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-7: Summary of Planned and Actual Harvest Area

			Area (ha) - Annualized													
			PLANNED HARVEST			ACTUAL HARVEST										
Forest Unit			Past Plans			Past Plans						Current Plan				
												2005-2010			Projections	
1990-2000	2000-2005	2005-2010	1990-1995	1995-2000	2000-2005	**1990-1995		**1995-2000		2000-2005		Planned Harvest	*Actual Harvest		Medium-Term 2025	Long-Term 2105
						Harvest	Natural	Harvest	Natural	Harvest	Natural		Harvest	Natural		
spruce 2/3	sbloc	BW1	3,303.6	3,544.8	2,432.8	3,447.0	-	3,558.4	254.4	1,885.1	-	25.0	15.6	-	38.7	80.8
	sbloh	LC1	-	-	1,329.2	-	-	-	-	834.8	-	-	-	-	-	-
spruce 1	spupl	MW1	1,775.0	2,010.4	1,578.4	1,712.6	-	1,731.6	151.0	1,280.6	-	74.0	72.2	-	51.5	60.4
	sphmx	MW2	-	-	1,354.8	-	-	-	-	947.3	-	793.0	493.4	-	618.5	547.0
poplar	popur	PJ1	1,317.8	1,726.0	761.0	1,445.4	-	1,344.4	63.6	544.6	-	226.0	217.4	-	165.3	219.2
	pomix	PJ2	-	-	683.4	-	-	-	-	538.4	-	213.0	153.6	-	117.9	65.9
pine	pjpur	PO1	611.4	550.0	311.4	587.8	-	481.2	-	270.3	-	583.0	441.7	-	453.6	643.4
	pjmix	SB1	-	-	196.6	-	-	-	-	150.9	-	472.0	407.8	-	587.4	1,274.9
birch	bwpur	SB3	376.2	327.0	4.0	302.4	-	160.0	-	6.8	-	3,774.0	2,251.6	-	2,652.2	2,626.7
	bwmix	SF1	-	-	196.2	-	-	-	-	160.6	-	671.0	397.9	-	585.4	393.7
fir	bfpmx	SP1	255.8	497.0	205.0	265.0	-	333.1	20.8	131.1	-	1,102.0	755.0	-	859.7	777.6
	othco				48.6					14.7	-					
		Total	7,639.8	8,655.2	9,101.4	7,760.2	-	7,608.5	489.8	6,765.3	-	7,933.0	5,206.3	-	6,130.2	6,689.6

*Data includes 05-06 to 08-09

**Note that data incl. IFS 1991 -1996 FMP in the IFF 1990-1995 FMP and IFS 1996-2001 FMP in IFF 1995-2000 FMP

MANAGEMENT UNIT NAME: Iroquois Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-8: Summary of Planned and Actual Harvest Volume

	Volume ('000 m^3) - Annualized									
	PLANNED HARVEST VOLUME			ACTUAL HARVEST VOLUME						
	Past Plans			Past Plans			Current Plan			
							2005-2010		Projections	
Species	**1990-1995**	**1995-2000**	**2000-2005**	**1990-1995**	**1995-2000**	**2000-2005**	**Planned Harvest**	***Actual Harvest**	**Medium-Term 2025**	**Long-Term 2105**
Sp	405,606.6	427,628.8	439,888.6	324,624.8	349,976.0	384,781.9	445,121.5	359,127.0	343,994.7	336,817.5
Bf	28,632.0	47,938.6	35,130.2	29,283.4	31,562.9	21,562.7	29,240.2	18,470.4	35,644.1	48,617.9
Pj	58,130.6	80,971.2	87,159.2	108,355.6	55,424.3	91,070.5	72,060.7	57,576.0	40,361.2	58,298.2
Ce	5,056.4	-	-	1.8	-	31.1	3,160.8	21.7	1,354.6	22,914.9
La	-	-	-	156.4	598.0	388.0	1,895.7	47.5	3,198.8	27,042.6
Po	182,005.8	213,679.5	177,382.4	158,836.0	150,445.6	148,357.2	167,090.2	99,912.2	118,386.0	169,444.9
Pb	-	-	-	403.0	-	-	3,857.7		11,517.9	24,130.1
Bw	13,523.8	2,750.0	1,854.6	2,956.0	1,997.8	10,065.2	30,560.5	10,050.2	27,297.9	36,314.6
Pw							-	1.1		
Pr							-	1.5		
Oh						0.6	-		18.9	54.6
Biofibre (Mx)								260.1		
Total	692,955.2	772,968.0	741,415.0	624,617.0	590,004.5	656,257.2	752,987.4	545,467.6	581,774.2	723,635.3

*Data includes 05-06 to 08-09

MANAGEMENT UNIT NAME: Iroquois Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-9: Summary of Planned and Actual Renewal, Tending and Protection Operations

	Area (ha) - Annualized							
	PLANNED			**ACTUAL**			**PLANNED**	**ACTUAL**
	Past Plans			**Past Plans**			**Current Plan**	**Current Plan**
Operation	**1990-1995**	**1995-2000**	**2000-2005**	**1990-1995**	**1995-2000**	**2000-2005**	**2005-2010**	**2005-2010**
Renewal								
Natural Regeneration								
Clearcut Silvicultural System (even-aged)	3,667.6	5,560.0	6,015.2	3,565.4	4,478.3	3,976.9	4,418.0	5,552.5
Shelterwood Silvicultural System (even-aged)								
Selection Silvicultural System - Selection Harvest (uneven-aged)								
Artificial Regeneration								
Planting	5,357.4	2,562.0	2,951.2	3,634.8	2,251.5	2,686.3	3,412.4	2,104.8
Seeding	750.0	532.2	206.6	530.0	103.0	106.8		
Scarification					63.8			
Total Renewal	9,775.0	8,654.2	9,173.0	7,730.2	6,896.5	6,769.9	7,830.4	7,657.3
Site Preparation (mechanical, chemical, prescribed burn)								
Mechanical	4,427.4	1,641.6	1,647.0	2,379.6	837.2	749.3	1,267.6	526.9
Chemical		150.0		222.4				
Prescribed Burn		162.8				56.0		
Total Site Preparation	4,427.4	1,954.4	1,647.0	2,602.0	837.2	805.3	1,267.6	526.9
Tending								
Cleaning	7,754.4	3,514.0	3,724.8	3,779.6	4,229.1	3,804.6	3,573.4	2,710.2
Spacing, Pre-Commercial Thinning, Improvement Cutting								
Clearcut and Shelterwood Silvicultural Systems (even-aged)						29.2		
Selection Silvicultural System (uneven-aged)								
Total Tending	7,754.4	3,514.0	3,724.8	3,779.6	4,229.1	3,833.8	3,573.4	2,710.2
Protection (Insect Pest Control)								

MANAGEMENT UNIT NAME: Iroquois Falls
PLAN PERIOD: 2005 To 2010
ANNUAL REPORT: 2009 To 2010

AR-10: Summary of Harvest and Regeneration Trends

		Term			
Forest Unit		******1990-1995**	*****1995-2000**	****2000-2005**	***2005-2010**
All FU's	**Harvest/Salvage (ha)**	38,801.0	40,491.5	33,826.5	20,825.1
	Surveyed (ha)	36,553.0	51,087.0	33,094.0	19,891.8
	Regenerated (ha)	35,869.0	45,304.0	30,606.0	19,693.4
	Unavailable for Regeneration (ha)	n/a	n/a	n/a	n/a
	Un-surveyed (ha)	n/a	n/a	n/a	n/a
	Percent FU Successfully Regenerated	92.4%	111.9%	90.5%	94.6%

Source: * 2005-2009 Annual Report
** 2000-2005 Annual Reports
*** 1995-2000 RPFO-8 (IFS incl. four yrs)
**** 1991-1996 final Table 4.7

MANAGEMENT UNIT NAME: Iroquois Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-11: Summary of Forest Condition for the Available Managed Crown Productive Forest

Forest Unit	Age/Condition Class	Area (ha)									
		Past Plans						Current Plan 2005-2010			
		1990-1995		1995-2000		2000-2005		Plan Start 2005	Plan End 2010	Projections	
										Medium-Term 2025	Long-Term 2105
		Protection	Production	Protection	Production	Protection	Production				
sbloc (Sp 2 and Sp 3 for 1990 and 1995)	b&s	na	132,649	na	55,049	0	21,443				
	1-10	na	8,154	na	4,646	0	16,635				
	11-20	na	9,786	na	11,210	0	803				
	21-30	na	27,391	na	2,490	0	1,548				
	31-40	na	28,990	na	14,525	61	2,387				
	41-50	na	31,030	na	146	21	6,973				
	51-60	na	44,458	na	36,308	0	9,754				
	61-70	na	32,376	na	1,787	12	5,434				
	71-80	na	59,453	na	25,928	103	7,848				
	81-90	na	29,595	na	1,185	91	8,202				
	91-100	na	33,249	na	43,944	273	8,666				
	101-110	na	57,040	na	413	599	9,051				
	111-120	na	59,280	na	66,699	642	12,363				
	121-130	na	28,068	na	605	1644	21,584				
	131-140	na	44,397	na	84,994	592	31,423				
	141-150	na	0	na	46	342	15,317				
	151-160	na	0	na	17,343	249	4,685				
	161-170	na	0	na	0	128	1,277				

	171-180	na	0	na	5,943	25	1,027				
	181-190	na	0	na	0	0	165				
	191-200	na	0	na	1,225	0	114				
Forest Unit Subtotal		**30,301**	**625,916**	**25,300**	**374,486**	**4,782**	**186,699**				
sbloh	b&s	na	na	na	na	0	14,235				
	1-10	na	na	na	na	4	15,949				
	11-20	na	na	na	na	37	4,752				
	21-30	na	na	na	na	0	218				
	31-40	na	na	na	na	0	1,901				
	41-50	na	na	na	na	0	4,871				
	51-60	na	na	na	na	0	4,360				
	61-70	na	na	na	na	108	3,118				
	71-80	na	na	na	na	283	3,410				
	81-90	na	na	na	na	1209	5,921				
	91-100	na	na	na	na	3351	6,101				
	101-110	na	na	na	na	3739	5,696				
	111-120	na	na	na	na	2609	6,731				
	121-130	na	na	na	na	4025	12,167				
	131-140	na	na	na	na	2512	15,197				
	141-150	na	na	na	na	984	10,288				
	151-160	na	na	na	na	219	4,271				
	161-170	na	na	na	na	243	1,015				
	171-180	na	na	na	na	162	1,911				
	181-190	na	na	na	na	2	72				
	191-200	na	na	na	na	0	108				
Forest Unit Subtotal		**na**	**na**	**0**	**0**	**19,487**	**122,292**				
spupl	b&s	na	971	na	50,845	0	28,620				
	1-10	na	618	na	8,199	0	16,403				
	11-20	na	620	na	32,726	25	22,807				
	21-30	na	32	na	1,298	0	11,724				
	31-40	na	38	na	27,394	0	13,488				
	41-50	na	165	na	1,021	0	9,209				
	51-60	na	1,050	na	28,886	0	11,660				

	61-70	na	335	na	7,754	0	16,958				
	71-80	na	1,683	na	46,018	0	21,608				
	81-90	na	617	na	6,918	0	13,635				
	91-100	na	618	na	19,559	0	8,867				
	101-110	na	130	na	90	0	5,125				
	111-120	na	132	na	14,611	0	2,796				
	121-130	na	58	na	156	0	6,681				
	131-140	na	82	na	17,069	0	8,280				
	141-150	na	0	na	43	0	4,508				
	151-160	na	0	na	2,732	0	1,198				
	161-170	na	0	na	0	0	604				
	171-180	na	0	na	660	0	235				
	181-190	na	0	na	0	0	36				
	191-200	na	0	na	41	0	0				
Forest Unit Subtotal		**0**	**7,149**	**0**	**266,020**	**25**	**204,442**				
sphmx	b&s	na	na	na	na	0	32				
	1-10	na	na	na	na	0	10,045				
	11-20	na	na	na	na	35	25,437				
	21-30	na	na	na	na	0	7,983				
	31-40	na	na	na	na	92	7,245				
	41-50	na	na	na	na	82	6,134				
	51-60	na	na	na	na	261	8,706				
	61-70	na	na	na	na	125	9,916				
	71-80	na	na	na	na	81	16,172				
	81-90	na	na	na	na	242	8,810				
	91-100	na	na	na	na	60	6,140				
	101-110	na	na	na	na	17	3,882				
	111-120	na	na	na	na	18	2,801				
	121-130	na	na	na	na	0	3,071				
	131-140	na	na	na	na	0	4,241				
	141-150	na	na	na	na	0	1,277				
	151-160	na	na	na	na	0	386				
	161-170	na	na	na	na	0	393				
	171-180	na	na	na	na	0	44				

	181-190	na	na	na	na	0	0				
	191-200	na	na	na	na	0	0				
Forest Unit Subtotal		**na**	**na**	**0**	**na**	**1,013**	**122,715**				
popur (poplar for 1990 & 1995)	b&s	na	13,333	na	9,444	0	6,822				
	1-10	na	5,307	na	2,826	0	8,001				
	11-20	na	9,072	na	4,002	0	3,600				
	21-30	na	3,323	na	4,487	0	1,485				
	31-40	na	6,294	na	15,736	46	6,238				
	41-50	na	11,989	na	632	0	845				
	51-60	na	15,698	na	10,108	0	1,911				
	61-70	na	12,586	na	2,181	0	4,607				
	71-80	na	19,258	na	35,524	14	14,322				
	81-90	na	3,346	na	1,874	0	4,343				
	91-100	na	3,621	na	11,693	0	2,156				
	101-110	na	334	na	87	0	881				
	111-120	na	335	na	2,453	0	182				
	121-130	na	39	na	0	0	0				
	131-140	na	172	na	226	0	121				
	141-150	na	0	na	0	0	0				
	151-160	na	0	na	0	0	0				
	161-170	na	0	na	0	0	0				
	171-180	na	0	na	129	0	0				
	181-190	na	0	na	0	0	129				
	191-200	na	0	na	0	0	0				
Forest Unit Subtotal		**798**	**104,707**	**976**	**101,402**	**60**	**55,643**				
pomix	b&s	na	na	na	na	0	0				
	1-10	na	na	na	na	0	4,104				
	11-20	na	na	na	na	56	1,482				
	21-30	na	na	na	na	152	2,998				
	31-40	na	na	na	na	0	4,970				
	41-50	na	na	na	na	0	1,469				
	51-60	na	na	na	na	183	1,990				
	61-70	na	na	na	na	99	3,691				

	71-80	na	na	na	na	29	6,304				
	81-90	na	na	na	na	101	4,509				
	91-100	na	na	na	na	15	2,657				
	101-110	na	na	na	na	25	1,594				
	111-120	na	na	na	na	0	362				
	121-130	na	na	na	na	0	43				
	131-140	na	na	na	na	0	72				
	141-150	na	na	na	na	0	0				
	151-160	na	na	na	na	0	0				
	161-170	na	na	na	na	0	0				
	171-180	na	na	na	na	0	0				
	181-190	na	na	na	na	0	0				
	191-200	na	na	na	na	0	0				
Forest Unit Subtotal		**na**	**na**	**0**	**na**	**660**	**36,245**				
pjpur	b&s	na	1,215	na	1,996	0	812				
	1-10	na	706	na	1,038	0	3,121				
	11-20	na	5,586	na	2,613	213	1,844				
	21-30	na	1,321	na	4,047	63	1,193				
	31-40	na	2,473	na	2,409	0	2,510				
	41-50	na	1,920	na	13	0	1,692				
	51-60	na	3,031	na	3,961	0	934				
	61-70	na	6,759	na	915	0	558				
	71-80	na	9,301	na	15,683	17	6,207				
	81-90	na	479	na	367	44	1,952				
	91-100	na	635	na	2,142	0	323				
	101-110	na	437	na	21	0	87				
	111-120	na	508	na	398	0	43				
	121-130	na	503	na	0	0	18				
	131-140	na	538	na	856	0	188				
	141-150	na	0	na	0	0	63				
	151-160	na	0	na	426	36	35				
	161-170	na	0	na	0	0	34				
	171-180	na	0	na	0	0	0				
	181-190	na	0	na	0	0	0				

	191-200	na	0	na	0	0	0				
	Forest Unit Subtotal	**240**	**35,412**	**451**	**36,885**	**373**	**21,614**				
pjmix	b&s	na	na	na	na	0	0				
	1-10	na	na	na	na	0	2,674				
	11-20	na	na	na	na	0	543				
	21-30	na	na	na	na	0	1,009				
	31-40	na	na	na	na	0	2,240				
	41-50	na	na	na	na	9	392				
	51-60	na	na	na	na	0	432				
	61-70	na	na	na	na	0	553				
	71-80	na	na	na	na	57	3,949				
	81-90	na	na	na	na	8	826				
	91-100	na	na	na	na	0	148				
	101-110	na	na	na	na	0	179				
	111-120	na	na	na	na	0	124				
	121-130	na	na	na	na	0	53				
	131-140	na	na	na	na	0	102				
	141-150	na	na	na	na	0	305				
	151-160	na	na	na	na	0	0				
	161-170	na	na	na	na	0	0				
	171-180	na	na	na	na	0	0				
	181-190	na	na	na	na	0	0				
	191-200	na	na	na	na	0	0				
	Forest Unit Subtotal	**na**	**na**	**0**	**0**	**74**	**13,529**				
bwpur (birch for 1990 and 1995)	b&s	na	2,595	na	1,846	0	1,959				
	1-10	na	566	na	810	0	346				
	11-20	na	566	na	1,656	13	47				
	21-30	na	952	na	433	0	63				
	31-40	na	1,712	na	1,358	18	13				
	41-50	na	1,483	na	612	14	32				
	51-60	na	4,312	na	4,008	16	243				
	61-70	na	1,500	na	780	0	414				
	71-80	na	4,723	na	4,583	0	669				

	81-90	na	696	na	1,306	0	188				
	91-100	na	1,322	na	1,781	0	27				
	101-110	na	328	na	208	0	180				
	111-120	na	413	na	930	0	0				
	121-130	na	128	na	0	0	0				
	131-140	na	579	na	345	0	0				
	141-150	na	0	na	0	0	0				
	151-160	na	0	na	212	0	0				
	161-170	na	0	na	0	0	0				
	171-180	na	0	na	0	0	0				
	181-190	na	0	na	0	0	0				
	191-200	na	0	na	14	0	0				
Forest Unit Subtotal		**1,517**	**21,875**	**969**	**20,882**	**61**	**4,181**				
bwmix	b&s	na	na	na	na	0	0				
	1-10	na	na	na	na	0	858				
	11-20	na	na	na	na	0	107				
	21-30	na	na	na	na	0	1,081				
	31-40	na	na	na	na	0	168				
	41-50	na	na	na	na	106	986				
	51-60	na	na	na	na	124	2,001				
	61-70	na	na	na	na	241	1,881				
	71-80	na	na	na	na	36	2,088				
	81-90	na	na	na	na	123	1,485				
	91-100	na	na	na	na	0	834				
	101-110	na	na	na	na	0	638				
	111-120	na	na	na	na	0	289				
	121-130	na	na	na	na	0	185				
	131-140	na	na	na	na	24	127				
	141-150	na	na	na	na	0	176				
	151-160	na	na	na	na	0	62				
	161-170	na	na	na	na	0	126				
	171-180	na	na	na	na	0	0				
	181-190	na	na	na	na	0	31				
	191-200	na	na	na	na	0	0				

Forest Unit Subtotal		**0**	**0**	**0**	**0**	**654**	**13,123**				
bfpmx	b&s	0	583	na	2,657	0	549				
	1-10	0	1,140	na	1,626	0	2,919				
	11-20	0	1,164	na	9	0	705				
	21-30	0	3,684	na	15	0	1,197				
	31-40	0	4,550	na	6,878	18	4,088				
	41-50	0	6,428	na	677	0	3,131				
	51-60	0	6,972	na	8,713	51	3,402				
	61-70	0	2,263	na	255	66	3,174				
	71-80	0	2,428	na	8,394	24	3,018				
	81-90	0	344	na	458	0	1,164				
	91-100	0	345	na	2,892	0	644				
	101-110	0	90	na	523	0	72				
	111-120	0	90	na	1,030	0	44				
	121-130	0	13	na	232	0	0				
	131-140	0	46	na	737	0	0				
	141-150	0	0	na	0	0	1				
	151-160	0	0	na	211	0	0				
	161-170	0	0	na	0	0	0				
	171-180	0	0	na	0	0	0				
	181-190	0	0	na	0	0	0				
	191-200	0	0	na	17	0	0				
Forest Unit Subtotal		**423**	**30,140**	**575**	**35,324**	**159**	**24,108**				
othco	b&s	0	1,330	na	na	0	898				
	1-10	0	0	na	na	0	0				
	11-20	0	7	na	na	10	107				
	21-30	0	105	na	na	0	13				
	31-40	0	105	na	na	0	7				
	41-50	0	83	na	na	0	16				
	51-60	0	205	na	na	0	295				
	61-70	0	56	na	na	0	97				
	71-80	0	1,062	na	na	68	254				
	81-90	0	201	na	na	39	477				

	91-100	0	1,421	na	na	115	522				
	101-110	0	253	na	na	92	470				
	111-120	0	980	na	na	80	339				
	121-130	0	154	na	na	73	278				
	131-140	0	792	na	na	69	248				
	141-150	0	0	na	na	0	114				
	151-160	0	0	na	na	0	61				
	161-170	0	0	na	na	0	96				
	171-180	0	0	na	na	0	0				
	181-190	0	0	na	na	0	0				
	191-200	0	0	na	na	0	0				
Forest Unit Subtotal		**588**	**6,754**	**369**		**546**	**4,292**				
2005-2010 FMP Forest Units											
Bog	b&s							-			
	1-10							61	-	-	-
	11-20							14	61	-	-
	21-30							-	14	-	-
	31-40							-	-	61	-
	41-50							82	-	14	-
	51-60							-	82	-	-
	61-70							122	-	-	-
	71-80							257	122	82	-
	81-90							524	257	-	-
	91-100							3,694	524	122	-
	101-110							4,689	3,694	257	-
	111-120							3,655	4,689	524	61
	121-130							5,490	3,655	3,694	14

	131-140							3,134	5,490	5,058	3,924
	141-150							1,336	3,134	3,657	5,058
	151-160							534	1,336	5,490	3,739
	161-170							230	534	3,134	5,490
	171-180							369	230	1,336	3,257
	181-190							2	369	534	1,593
	191-200							-	2	230	1,058
	200+							9	9	9	9
	Forest Unit Subtotal							24,202	24,202	24,202	24,202
Bw1	b&s							204			
	1-10							1,605	976	1,586	1,300
	11-20							2,355	1,605	1,573	1,653
	21-30							677	2,067	1,133	1,674
	31-40							297	694	1,662	2,277
	41-50							379	410	2,338	2,229
	51-60							621	362	842	1,791
	61-70							818	650	418	2,213
	71-80							1,265	830	418	2,284
	81-90							752	1,757	664	2,293
	91-100							646	902	633	1,645
	101-110							352	770	1,638	1,015
	111-120							287	344	807	569
	121-130							52	169	602	669
	131-140							-	85	315	323

	141-150							-	-	114	874
	151-160							-	-	60	322
	161-170							-	-	-	68
	171-180							-	-	-	-
	181-190							-	-	-	-
	191-200							-	-	-	-
	200+							-	-	-	0
	Forest Unit Subtotal							10,309	11,622	14,802	23,199
LC1	b&s							103			
	1-10							504	-	24	25
	11-20							973	450	44	25
	21-30							38	1,067	23	28
	31-40							20	38	449	29
	41-50							87	41	1,064	32
	51-60							109	90	37	34
	61-70							151	114	41	36
	71-80							106	151	90	38
	81-90							365	106	114	40
	91-100							370	365	151	43
	101-110							555	391	105	23
	111-120							1,275	815	364	443
	121-130							20	420	390	1,050
	131-140							236	20	812	37
	141-150							170	287	418	40

	151-160							-	591	20	88
	161-170							42	-	286	113
	171-180							-	98	589	149
	181-190							-	-	-	104
	191-200							-	-	97	359
	200+							-	-	-	2,449
Forest Unit Subtotal								5,124	5,043	5,117	5,185
Mw1	b&s							-			
	1-10							469	379	459	711
	11-20							445	293	631	998
	21-30							147	445	490	787
	31-40							289	147	293	706
	41-50							338	289	487	863
	51-60							343	338	310	1,119
	61-70							1,010	343	559	1,155
	71-80							1,038	1,193	590	1,995
	81-90							679	1,343	220	1,571
	91-100							82	270	1,083	1,482
	101-110							129	73	550	1,064
	111-120							75	36	268	601
	121-130							-	23	72	467
	131-140							-	-	115	451
	141-150							11	-	46	356
	151-160							-	11	41	692

	161-170							-	-	0	210
	171-180							-	-	-	-
	181-190							-	-	-	-
	191-200							-	-	-	-
	200+							-	-	-	0
	Forest Unit Subtotal							5,054	5,182	6,214	15,227
Mw2	b&s							-			
	1-10							4,008	5,935	5,142	4,814
	11-20							1,831	2,508	6,337	5,458
	21-30							3,579	1,823	6,620	5,301
	31-40							10,594	3,579	2,488	7,179
	41-50							4,887	11,091	1,876	6,438
	51-60							3,972	5,223	3,840	6,183
	61-70							6,819	4,495	11,506	6,769
	71-80							8,300	7,317	6,654	8,065
	81-90							9,367	8,619	3,384	9,027
	91-100							5,564	7,326	3,471	5,619
	101-110							2,418	3,299	3,947	4,806
	111-120							1,825	1,256	4,291	2,631
	121-130							1,424	1,052	3,205	2,567
	131-140							1,273	1,726	1,246	2,235
	141-150							546	1,389	793	2,034
	151-160							150	546	1,301	1,203
	161-170							240	150	702	572

	171-180							-	240	-	-
	181-190							-	-	-	-
	191-200							31	-	238	-
	200+							-	31	-	1
Forest Unit Subtotal								66,828	67,607	67,043	80,902
Pj1	b&s							136			
	1-10							3,824	3,374	2,570	2,573
	11-20							3,218	3,595	3,057	2,706
	21-30							1,617	3,228	3,433	3,813
	31-40							2,328	1,623	3,559	3,691
	41-50							1,236	2,335	3,196	3,784
	51-60							1,670	1,298	1,607	2,973
	61-70							670	1,728	2,312	2,859
	71-80							1,348	718	820	2,247
	81-90							4,551	1,785	1,711	802
	91-100							1,052	4,347	711	508
	101-110							249	976	1,482	182
	111-120							73	246	1,725	513
	121-130							22	117	830	73
	131-140							169	201	185	219
	141-150							32	169	-	-
	151-160							81	32	-	-
	161-170							34	81	167	-
	171-180							-	34	32	-

	181-190							-	-	-	44
	191-200							-	-	-	-
	200+							-	-	-	-
Forest Unit Subtotal								22,308	25,889	27,398	26,988
Pj2	b&s							-			
	1-10							866	927	609	628
	11-20							1,043	542	805	827
	21-30							1,230	1,043	998	678
	31-40							2,875	1,230	537	542
	41-50							164	2,922	1,033	705
	51-60							553	216	1,217	910
	61-70							560	553	2,893	787
	71-80							580	560	189	669
	81-90							3,584	718	325	24
	91-100							329	2,323	24	26
	101-110							67	150	185	21
	111-120							74	26	895	15
	121-130							34	78	149	37
	131-140							14	36	75	79
	141-150							223	14	180	146
	151-160							16	223	-	-
	161-170							-	16	-	-
	171-180							-	-	-	-
	181-190							-	-	-	-

	191-200							-	-	-	1
	200+							-	-	-	-
	Forest Unit Subtotal							12,212	11,578	10,113	6,093
Po1	b&s							1,041			
	1-10							13,054	7,679	7,351	8,336
	11-20							16,263	13,102	8,345	10,395
	21-30							1,695	16,460	8,658	11,877
	31-40							6,922	1,695	13,015	12,421
	41-50							3,516	7,103	16,351	10,574
	51-60							1,675	3,583	1,684	8,210
	61-70							3,724	1,685	7,056	7,500
	71-80							11,582	3,879	3,559	6,915
	81-90							9,498	12,288	1,673	2,733
	91-100							3,079	6,055	1,279	994
	101-110							1,702	2,170	6,180	933
	111-120							785	1,825	5,087	1,813
	121-130							13	478	2,155	2,576
	131-140							105	82	1,377	253
	141-150							-	105	352	969
	151-160							-	-	69	449
	161-170							-	-	-	-
	171-180							-	-	-	-
	181-190							78	-	-	-
	191-200							-	78	-	-

	200+							-	-	-	12
	Forest Unit Subtotal							74,732	78,267	84,191	86,961
Sb1	b&s							1,981			
	1-10							21,017	8,042	7,995	14,427
	11-20							22,626	19,502	8,502	17,096
	21-30							19,501	22,789	8,690	18,053
	31-40							6,850	19,732	19,416	15,323
	41-50							7,201	6,933	22,688	14,039
	51-60							9,173	7,330	19,644	13,220
	61-70							7,313	9,200	6,902	11,100
	71-80							11,668	7,486	7,298	9,345
	81-90							6,932	11,915	9,160	8,504
	91-100							7,224	7,381	7,452	8,352
	101-110							3,172	6,759	10,269	7,692
	111-120							2,695	3,697	2,371	5,612
	121-130							3,925	1,677	2,757	1,153
	131-140							4,648	2,782	3,708	3,657
	141-150							3,047	5,724	2,034	2,584
	151-160							869	3,447	2,770	4,359
	161-170							246	879	5,699	3,307
	171-180							270	246	3,432	2,626
	181-190							3	292	613	4,550
	191-200							-	3	-	-
	200+							7	7	10	565

Forest Unit Subtotal								140,367	145,824	151,408	165,566
Sb3	b&s							10,415			
	1-10							34,217	37,372	26,745	26,770
	11-20							52,436	30,380	21,343	13,703
	21-30							7,950	52,918	25,109	11,713
	31-40							5,779	8,079	42,346	19,611
	41-50							7,392	5,786	67,237	18,655
	51-60							14,100	9,060	8,052	16,002
	61-70							12,371	14,215	5,767	19,689
	71-80							9,455	12,526	9,030	20,641
	81-90							10,545	9,803	14,168	24,572
	91-100							19,118	10,951	12,484	29,185
	101-110							14,097	20,512	9,771	34,915
	111-120							19,407	15,475	10,402	41,785
	121-130							28,420	22,089	15,145	15,401
	131-140							38,640	30,611	6,461	3,777
	141-150							20,690	24,172	8,625	4,296
	151-160							7,631	9,636	10,515	7,388
	161-170							2,685	2,015	16,418	8,018
	171-180							2,639	2,709	9,604	7,289
	181-190							118	2,739	2,009	4,215
	191-200							324	118	2,700	2,256
	200+							50	374	1,387	4,405
Forest Unit Subtotal								318,477	321,543	325,319	334,284

Sf1	b&s							555			
	1-10							6,056	3,331	3,964	2,847
	11-20							9,392	5,083	4,099	4,147
	21-30							5,942	9,436	3,602	4,510
	31-40							8,383	5,942	5,191	5,617
	41-50							7,357	8,521	9,892	5,313
	51-60							6,350	7,386	6,487	3,893
	61-70							6,276	6,380	8,624	4,853
	71-80							7,927	6,744	7,616	5,350
	81-90							6,452	8,330	4,496	3,894
	91-100							4,125	5,306	2,979	989
	101-110							1,852	2,223	4,267	976
	111-120							1,489	970	2,548	987
	121-130							890	765	2,237	1,010
	131-140							804	1,441	1,285	745
	141-150							696	857	559	576
	151-160							116	766	981	661
	161-170							299	150	170	160
	171-180							46	334	152	188
	181-190							-	85	-	-
	191-200							-	-	-	-
	200+							15	15	84	8
Forest Unit Subtotal								75,023	74,065	69,234	46,725

ABITIBI RIVER
Forest Management Inc

Sp1	b&s							-			
	1-10							3,887	10,085	5,948	6,547
	11-20							7,737	3,107	8,537	5,047
	21-30							11,103	7,947	10,540	4,991
	31-40							5,809	11,118	3,082	3,680
	41-50							7,240	5,999	7,884	6,463
	51-60							5,557	7,309	11,112	8,967
	61-70							7,451	5,605	6,281	7,561
	71-80							8,910	7,529	7,795	6,536
	81-90							7,833	9,394	4,242	6,663
	91-100							6,299	7,849	1,482	1,832
	101-110							2,375	1,943	3,790	666
	111-120							1,967	1,144	2,022	981
	121-130							1,994	1,188	1,928	809
	131-140							2,715	1,286	1,135	521
	141-150							922	1,518	893	638
	151-160							505	1,035	1,164	805
	161-170							256	835	678	272
	171-180							-	256	462	578
	181-190							6	-	-	-
	191-200							-	12	-	-
	200+							-	-	-	27
Forest Unit Subtotal								82,566	85,158	78,972	63,582

All Fus	b&s	-	152,676	-	121,837	-	75,370	14,435			
	1-10	-	16,491	-	19,145	4	81,055	89,570	78,099	62,393	68,978
	11-20	-	26,801	-	52,216	389	62,234	118,331	80,229	63,273	62,054
	21-30	-	36,808	-	12,770	215	30,512	53,478	119,238	69,296	63,425
	31-40	-	44,162	-	68,300	235	45,255	50,145	53,877	92,098	71,077
	41-50	-	53,098	-	3,101	232	35,750	39,878	51,429	134,059	69,095
	51-60	-	75,726	-	91,984	635	45,688	44,121	42,278	54,833	63,300
	61-70	-	55,875	-	13,672	651	50,401	47,286	44,968	52,358	64,523
	71-80	-	97,908	-	136,130	712	85,849	62,434	49,057	44,141	64,085
	81-90	-	35,278	-	12,108	1,857	51,512	61,081	66,315	40,157	60,123
	91-100	-	41,211	-	82,011	3,814	37,085	51,580	53,601	31,871	50,674
	101-110	-	58,612	-	1,342	4,472	27,855	31,657	42,959	42,440	52,291
	111-120	-	61,738	-	86,121	3,349	26,074	33,608	30,524	31,303	56,011
	121-130	-	28,963	-	993	5,742	44,080	42,284	31,712	33,163	25,825
	131-140	-	46,606	-	104,227	3,197	59,999	51,738	43,761	21,771	16,220
	141-150	-	-	-	89	1,326	32,049	27,674	37,369	17,672	17,571
	151-160	-	-	-	20,924	504	10,698	9,904	17,623	22,412	19,706
	161-170	-	-	-	-	371	3,545	4,032	4,662	27,255	18,211
	171-180	-	-	-	6,732	187	3,217	3,325	4,147	15,606	14,087
	181-190	-	-	-	-	2	433	207	3,485	3,156	10,506
	191-200	-	-	-	1,297	-	222	355	213	3,265	3,674
	200+							81			
All Forest Unit Total		33,867	831,953	28,640	834,999	27,894	808,883	837,204	855,544	862,523	871,437
Total Productive Forest		**865,820**		**863,639**		**836,777**		**837,204**	**855,544**	**862,523**	**871,437**

Sources:
1990-95 available based on Table 4.9, while remaining areas based on Table 4.8.2.
1995-00 available based on Table 4.13.1 and Table 4.8.2.
2000-2005 based on FMP-9
2005-2010 Plan Start based on FMP-9 (2005 2010 FMP)

MANAGEMENT UNIT NAME: Iroquois Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-11: Summary of Forest Condition for the Available Managed Crown Productive Forest

		Area (ha)									
Forest Unit	**Age/Condition Class**	**Past Plans**						**Current Plan 2005-2010**			
		1990-1995		**1995-2000**		**2000-2005**		**Plan Start 2005**	**Plan End 2010**	**Projections**	
		Protection	**Production**	**Protection**	**Production**	**Protection**	**Production**			**Medium-Term 2025**	**Long-Term 2105**
sbloc		30,301	625,916	25,300	374,486	4,782	186,699				
sbloh		na	na	0	0	19,487	122,292				
spupl		0	7,149	0	266,020	25	204,442				
pjpur		240	35,412	451	36,885	373	21,614				
pjmix		na	na	0	0	74	13,529				
othco		588	6,754	369		546	4,292				
LC1								5124	5043	5117	5185
Pj1								22308	25889	27398	26988
Pj2								12212	11578	10113	6093
Sb1								140367	145824	151408	165566
Sb3								318477	321543	325319	334284
Sf1								75023	74065	69234	46725
Sp1								82566	85158	78972	63582
Forest Unit Subtotal		**31,129**	**675231**	**26120**	**677391**	**25287**	**552868**	**656078**	**669101**	**667561**	**648423**

Forest Unit	Age/Condition Class	Past Plans						Current Plan 2005-2010			
		1990-1995		1995-2000		2000-2005		Plan Start 2005	Plan End 2010	Projections	
										Medium-Term 2025	Long-Term 2105
MW	**sphmx**	na	na	0	na	1,013	122,715				
	pomix	na	na	0	na	660	36,245				
	bwmix	0	0	0	0	654	13,123				
	bfpmx	423	30,140	575	35,324	159	24,108				
	Mw1							5054	5182	6214	15227
	Mw2							66828	67607	67043	80902
Forest Unit Subtotal		**423**	**30140**	**575**	**35324**	**813**	**37231**	**71882**	**72789**	**73257**	**96129**
Hdwd											
	popur	798	104,707	976	101,402	60	55,643				
	bwpur	1,517	21,875	969	20,882	61	4,181				
	Bw1							10309	11622	14802	23199
	Po1							74732	78267	84191	86961
Forest Unit Subtotal		**2,315**	**126582**	**1945**	**122284**	**121**	**59824**	**85041**	**89889**	**98993**	**110159**
All Fus											
All Forest Unit Total		33,867	-	28,640	-	27,894	808,883	**837204**	**855544**	**862523**	**871437**
Total Productive Forest		**33,867**		**28,640**		**836,777**		**837204**	**855544**	**862523**	**871437**

Sources:

1990-95 available based on Table 4.9, while remaining areas based on Table 4.8.2.
1995-00 available based on Table 4.13.1 and Table 4.8.2.
2000-2005 based on FMP-9
2005-2010 Plan Start based on FMP-9 (2005 2010 FMP)

MANAGEMENT UNIT NAME: Iroquois Falls
PLAN PERIOD: 2005 To 2010
ANNUAL REPORT: 2009 To 2010

AR-12: Summary of Habitat for Species at Risk and Selected Wildlife Species

	Area of Habitat (ha)							
	Past Plans			**Current Plan 2005-2010**				
				Plan Start	**Projections**			**Plan End**
Wildlife Species					**Short-Term**	**Medium- Term**	**Long-Term**	
	1990-1995	**1995-2000**	**2000-2005**	**2005**	**2015**	**2025**	**2105**	**2010**
bay breasted warbler	n/a	n/a	166,952	112,148	98,514	93,942	91,155	108,948
black backed woodpecker	n/a	n/a	105,871	58,159	60,637	60,355	55,346	62,083
black bear foraging	n/a	n/a	4,429	3,942	3,544	2,973	3,096	4,111
black bear fall winter	n/a	n/a	76,376	75,435	65,647	63,670	72,498	72,479
boreal chickadee	n/a	n/a	74,692	48,963	62,113	63,969	70,740	57,830
blue spotted salamander	n/a	n/a	0	662,719	0	0	655,331	0
lynx	n/a	n/a	78,205	93,010	108,755	116,044	102,474	102,063
caribou	n/a	n/a	12,223	6,868	5,568	5,131	3,116	5,832
deer mouse	n/a	n/a	49,481	62,042	64,209	62,838	70,148	70,850
great gray owl	n/a	n/a	56,327	21,502	18,651	17,785	18,980	20,607
least flycatcher	n/a	n/a	131,050	67,106	77,648	79,861	85,251	74,887
marten	n/a	n/a	162,271	125,504	118,369	114,577	115,795	126,611
moose foraging	n/a	n/a	48,201	57,973	59,850	58,109	64,933	66,192
moose winter	n/a	n/a	172,325	168,068	157,709	155,933	145,452	162,112
northern flying squirrel	n/a	n/a	193,517	137,973	127,759	127,468	130,022	135,860
pileated woodpecker	n/a	n/a	8,788	3,251	10,033	13,904	7,531	5,403
ruby crowned kinglet	n/a	n/a	256,708	255,547	205,357	252,881	311,937	223,988
ruffed grouse	n/a	n/a	31,591	28,371	29,861	31,167	38,428	28,796
snowshoe hare	n/a	n/a	78,205	93,010	108,755	116,044	102,474	102,063
spruce grouse	n/a	n/a	15,629	10,414	10,086	10,243	10,681	9,871
white throated sparrow	n/a	n/a	95,800	143,790	134,363	117,572	134,040	151,914

Source: 2000-2005 RPFO-16
2005-2010 FMP-5

MANAGEMENT UNIT NAME: Iroquois Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2005 To 2009 (4 years)

AR-13: Summary of Assessment of Regeneration and Silvicultural Success

		Area Assessed				
		Area Successfully Regenerated				
Forest Unit	Silvicultural Ground Rule	Projected Forest Unit	Other Forest Unit	Total	Area Not Successfully Regenerated	Total Area Assessed
Harvest						
BW1	000	26.7	100.1	126.8		126.8
	001		24.4	24.4		24.4
	010			0.0	23.1	23.1
	040		42.3	42.3		42.3
	041		104.0	104.0		104.0
	140		3.2	3.2		3.2
	141		62.7	62.7		62.7
	Forest Unit Subtotal	26.7	336.8	363.4	23.1	386.5
LC1	000	1.0	14.1	15.1		15.1
	001		0.0	0.0		0.0
	040		0.0	0.0		0.0
	041		7.2	7.2		7.2
	Forest Unit Subtotal	1.0	21.3	22.3	0.0	22.3
MW1	000		8.0	8.0		8.0
	Forest Unit Subtotal	0.0	8.0	8.0	0.0	8.0
MW2	000	2.5	227.1	229.6	2.4	232.0
	001	0.6	0.3	0.9	0.2	1.1

Forest Unit	Silvicultural Ground Rule	Area Successfully Regenerated			Area Not Successfully Regenerated	Total Area Assessed
		Projected Forest Unit	Other Forest Unit	Total		
	040		3.5	3.5		3.5
	041		0.3	0.3		0.3
	140		0.0	0.0		0.0
	Forest Unit Subtotal	3.1	231.2	234.3	2.5	236.9
PJ1	000	5.3	407.0	412.3		412.3
	001		22.3	22.3		22.3
	020		186.0	186.0	22.6	208.6
	040	12.9	467.0	479.9		479.9
	041		54.5	54.5		54.5
	100		0.0	0.0		0.0
	140	60.8	133.8	194.6		194.6
	150		98.5	98.5		98.5
	240	106.9	9.0	115.8		115.8
	250		304.1	304.1		304.1
	Forest Unit Subtotal	185.9	1682.2	1868.1	22.6	1890.7
PJ2	000	0.5	3.7	4.2		4.2
	040	0.0	5.6	5.6		5.6
	041		0.0	0.0		0.0
	140		0.5	0.5		0.5
	Forest Unit Subtotal	0.5	9.8	10.3	0.0	10.3
PO1	000	2106.3	406.4	2512.7	2.2	2514.9
	001	7.8	382.9	390.7		390.7
	010	148.0		148.0		148.0
	030		26.7	26.7		26.7
	032		22.6	22.6		22.6

Forest Unit	Silvicultural Ground Rule	Area Successfully Regenerated			Area Not Successfully Regenerated	Total Area Assessed
		Projected Forest Unit	Other Forest Unit	Total		
	040	16.6	12.1	28.7		28.7
	041	0.6	160.6	161.2		161.2
	130		25.3	25.3		25.3
	132		43.7	43.7		43.7
	140		169.0	169.0		169.0
	141		8.0	8.0		8.0
	150		29.4	29.4		29.4
	441		36.2	36.2		36.2
	Forest Unit Subtotal	2279.3	1323.0	3602.3	2.2	3604.5
SB1	000	583.4	1150.2	1733.6	0.7	1734.4
	001	223.6	593.6	817.2	5.4	822.6
	030	117.4	238.7	356.1		356.1
	031	9.8	370.0	379.8		379.8
	040	247.5	150.0	397.5		397.5
	041	72.4	262.7	335.1		335.1
	101		2.7	2.7		2.7
	130		0.4	0.4		0.4
	131	0.0	76.4	76.4		76.4
	140	0.1	7.6	7.6		7.6
	141	0.1	117.6	117.7		117.7
	150		58.9	58.9		58.9
	240		6.5	6.5		6.5
	441		18.3	18.3		18.3
	540		0.0	0.0		0.0
	541		8.9	8.9		8.9

Forest Unit	Silvicultural Ground Rule	Area Successfully Regenerated			Area Not Successfully Regenerated	Total Area Assessed
		Projected Forest Unit	Other Forest Unit	Total		
	Forest Unit Subtotal	1254.2	3062.5	4316.7	6.1	4322.8
SB3	000	1546.4	1190.6	2737.0	1.8	2738.9
	001	2085.1	1016.8	3101.9	1.4	3103.3
	030	15.6	35.6	51.2		51.2
	031		114.4	114.4		114.4
	040	172.3	59.7	232.1		232.1
	041	250.3	6.4	256.8		256.8
	051	1.2		1.2		1.2
	100		0.5	0.5		0.5
	101	39.8	5.3	45.1		45.1
	130	1.1	2.1	3.1		3.1
	131	0.1	103.7	103.8		103.8
	140	1.5	11.1	12.6		12.6
	141	12.8	201.6	214.4		214.4
	150		1.4	1.4		1.4
	400		0.0	0.0		0.0
	440		0.3	0.3		0.3
	Forest Unit Subtotal	4126.1	2749.4	6875.5	3.3	6878.8
SF1	000	82.1	85.3	167.4	19.7	187.1
	001	18.7	1.9	20.7	0.9	21.5
	030		178.6	178.6		178.6
	031		180.1	180.1		180.1
	040		15.6	15.6		15.6
	041		65.8	65.8		65.8
	130		125.9	125.9		125.9

Forest Unit	Silvicultural Ground Rule	Area Successfully Regenerated			Area Not Successfully Regenerated	Total Area Assessed
		Projected Forest Unit	Other Forest Unit	Total		
	131		254.3	254.3		254.3
	140		0.3	0.3		0.3
	141	3.8	199.0	202.9		202.9
	Forest Unit Subtotal	104.7	1106.8	1211.5	20.5	1232.1
SP1	000	6.1	34.3	40.3	3.9	44.3
	001	0.8	0.8	1.6		1.6
	030		0.0	0.0		0.0
	040	0.0	0.6	0.6		0.6
	041		0.6	0.6		0.6
	140		2.2	2.2		2.2
	141		0.1	0.1		0.1
	150	0.2		0.2		0.2
	540	0.2		0.2		
	Forest Unit Subtotal	7.3	38.4	45.8	3.9	49.5
	Harvest Subtotal	7988.8	10569.4	18558.2	84.3	18642.2
Natural Disturbance						
MW2	000			0.0	5.3	5.3
	001			0.0	1.0	1.0
	Forest Unit Subtotal	0.0	0.0	0.0	6.2	6.2
PO1	000			0.0	6.4	6.4
	Forest Unit Subtotal	0.0	0.0	0.0	6.4	6.4
SB1	000			0.0	12.6	12.6
	001			0.0	32.4	32.4

Forest Unit	Silvicultural Ground Rule	Area Successfully Regenerated			Area Not Successfully Regenerated	Total Area Assessed
		Projected Forest Unit	Other Forest Unit	Total		
	051		87.6	87.6		87.6
	130		20.9	20.9		20.9
	131		72.9	72.9		72.9
	Forest Unit Subtotal	0.0	181.4	181.4	45.0	226.4
SB3	000		13.7	13.7	30.0	43.7
	001			0.0	6.8	6.8
	050	11.4		11.4		11.4
	051	251.6	179.1	430.7		430.7
	141		410.9	410.9		410.9
	Forest Unit Subtotal	263.0	603.7	866.7	36.8	903.5
SF1	000			0.0	11.1	11.1
	001			0.0	8.7	8.7
	131	0.0	86.8	86.8		86.8
	Forest Unit Subtotal	0.0	86.8	86.8	19.8	106.6
SP1	000			0.0	0.0	0.0
	051		0.4	0.4		0.4
	Forest Unit Subtotal	0.0	0.4	0.4	0.0	0.4
	Disturbance Subtotal	263.0	872.3	1135.2	114.3	1249.5
	Total	8251.7	11441.7	19693.4	198.6	19891.8

MANAGEMENT UNIT NAME: Iroquois Falls

PLAN PERIOD: 2005 To 2010

ANNUAL REPORT: 2009 To 2010

AR-14: Assessment of Objective Achievement

						Strategic Projections		
Management Objective	**Indicator**	**Plan Start Level**	**Desirable Level**	**Timing of Assessment**	**Target**	**Medium (2025)**	**Long (2105)**	**Assessment**
Quantitative Objectives								
1. Forest Diversity Objective Group								
A. Forest Unit Area (available and reserved in hectares)								
Total All Fus	Bound of Natural Variation (measured in ha)	852,566.5	>= min. NBV	FMP Development	>=682,365	863,559.1	880,954.9	Assessment completed during the development of the FMP (page 99) and concluded that all forest units were well within the bounds of natural variation.
Bog		24,202.2	>= min. NBV		>=19,362	24,202.2	24,202.2	
Bw1		10,675.8	>= min. NBV		>=8,541	13,206.7	22,690.7	
LC1		5,015.5	>= min. NBV		>=4,012	5,081.8	5,188.2	
MW1		5,491.5	>= min. NBV		>=4,393	5,548.0	14,714.5	
MW2		69,104.9	>= min. NBV		>=33,339	67,294.9	81,209.4	
PJ1		24,521.7	>= min. NBV		>=19,617	26,762.9	27,068.6	
PJ2		12,668.6	>= min. NBV		>=10,135	10,947.6	6,026.9	
PO1		74,488.9	>= min. NBV		>=59,952	81,572.1	85,657.6	
SB1		141,807.0	>= min. NBV		>=113,443	149,121.7	164,223.6	
SB3		319,139.0	>= min. NBV		>=255,311	323,584.6	333,515.4	
SF1		77,022.8	>= min. NBV		>=21,629	70,886.4	47,930.2	
SP1		85,434.8	>= min. NBV		>=32,203	82,356.2	65,533.6	
B. Age Class Structure - Mature % 3E1 Sub-unit								
Spruce/Pine (PJSB) >=A85	Proportion of the Area within each forest unit group	34%	n/a	FMP Development	>=17%	23.8%	22.8%	Initial assessment completed during the development of the FMP. This objective is to have the available and reserved area proportion within each forest unit
Intolerant Hardwoods (IH) >=A65		54%	n/a		>=31%	38.7%	31.6%	
Mixedwoods (MW) >= A75		44%	n/a		>=38%	38.3%	47.2%	
Black Spruce Lowland (SBL) >= A85		49%	n/a		>=31%	38.9%	50.1%	

Jack Pine (Pj) >= A75		49%	n/a		>=17%	37.6%	17.3%	groupto be no less than the mature targets from T3-T16.
Spruce/Fir (SF) >= A85		21%	n/a		>=20%	22.3%	20.0%	
C. Age Class Structure - Overmature % 3E1 Sub-unit								
Spruce/Pine (PJSB) >=A105	Proportion of the Area within each forest unit group	17%	n/a	FMP Development	>=8%	12.5%	8.0%	Initial assessment completed during the development of the FMP. This objective is to have the available and reserved area proportion within each forest unit groupto be no less than the over-mature targets from T3-T16
Intolerant Hardwoods (IH) >=A95		13%	n/a		>=10%	24.4%	9.9%	
Mixedwoods (MW) >= A105		15%	n/a		>=15%	17.9%	18.3%	
Black Spruce Lowland (SBL) >=A125		29%	n/a		>=14%	22.0%	14.0%	
Jack Pine (Pj) >= A115		2%	n/a		>=2%	3.0%	3.0%	
Spruce/Fir (SF) >=A115		8%	n/a		>=7%	7.9%	9.2%	
D. Age Class Structure - Mature % 3E6 Sub-unit								
Spruce/Pine (PJSB) >=A85	Proportion of the Area within each forest unit group	33%	n/a	FMP Development	>=19%	39.8%	22.1%	Initial assessment completed during the development of the FMP. This objective is to have the available and reserved area proportion within each forest unit groupto be no less than the mature targets from T3-T16
Intolerant Hardwoods (IH) >=A65		30%	n/a		>=24%	26.6%	36.0%	
Mixedwoods (MW) >= A75		59%	n/a		>=44%	63.9%	52.5%	
Black Spruce Lowland (SBL) >= A85		30%	n/a		>=21%	30.1%	49.3%	
Jack Pine (Pj) >= A75		28%	n/a		>=17%	17.0%	17.0%	
Spruce/Fir (SF) >= A85		44%	n/a		>=24%	52.3%	24.4%	
E. Age Class Structure - Overmature % 3E6 Sub-unit								
Spruce/Pine (PJSB) >=A105	Proportion of the Area within each forest unit group	2%	n/a	FMP Development	>=2%	18.9%	9.0%	Initial assessment completed during the development of the FMP. This objective is to have the available and reserved area proportion within each forest unit groupto be no less than the over-mature targets from T3-T16
Intolerant Hardwoods (IH) >=A95		4%	n/a		>=4%	19.7%	14.0%	
Mixedwoods (MW) >= A105		3%	n/a		>=3%	24.8%	15.4%	
Black Spruce Lowland (SBL) >=A125		6%	n/a		>=4%	6.4%	13.9%	
Jack Pine (Pj) >= A115		4%	n/a		>=3%	12.1%	3.0%	
Spruce/Fir (SF) >=A115		7%	n/a		>=7%	13.1%	9.5%	
F. Age Class Structure-All Sus Sb Lowland Omat%								
Lowland Sb Overmature		37%	n/a	FMP Development	>=20%	29.4%	34.1%	Initial assessment completed during the development of the FMP. This objective is to have the available and reserved area proportion within each forest unit groupto be no less than the over-mature targets from T3-T16
2. Social and Economic Group								

A.3E1 SPF Wood Supply	1,000 m3/yr	445.000	n/a	FMP Development	>=476	360.000	367.277	AR-8 shows actual achievement to date of harvest volumes as follows: SPF - 435,173 per yearfor both sub-units combined and 99,912 m3/yr and 10,050 m3/yr of poplar ans birch respectively. Net reduction in harvest volumes due to reduced harvesting activities through planning period.
B.3E6 SPF Wood Supply		65.000	n/a		>=93	60.000	76.457	
C. All SUs Po Wood Supply		134.000	n/a		>=118.386	118.386	169.445	
D. All SUs Bw Wood Supply		30.716	n/a		>=38.600	27.298	36.315	
E.3E1 SPF Vol Flow	% fluctuation in harvest volume between 10 yr planning terms	n/a	n/a	FMP Development	<=20%	13%	15%	Assessed during FMP development. Have harvested first four years of a 10 year planning term therefore not assessable at this time.
F.3E6 SPF Vol Flow		n/a	n/a		<=30%	-9%	9%	
G. All SUs SPF Vol Flow		n/a	n/a		<=20%	11%	14%	
H.3E1 Po Vol Flow		n/a	n/a		<=20%	19%	7%	
I.3E6 Po Vol Flow		n/a	n/a		<=30%	-23%	1%	
J. All SUs Po Vol Flow		n/a	n/a		<=20%	12%	5%	
K.3E1 Bw Vol Flow		n/a	n/a		<=25%	19%	0%	
L.3E6 Bw Vol Flow		n/a	n/a		<=30%	-23%	4%	
M. All SUs Bw Vol Flow		n/a	n/a		<=20%	7%	1%	
3. Silviculture Objective Group								
A. Renewal Revenues	Revenues surpasses expected Expenditure ($)	3,230	n/a	FMP Development	n/a	2,667	3,137	The revenues required to support the expenditures for the renewal program have not been achieved due to lower than expected harvest volumes. As detiled in section 4.1.3 of the trend Analysis, a plan is in place to ensure that renewal funds meet minimum balance requirements by March 31, 2012.
A. Renewal Expenditures		2,913	n/a		n/a	1,901	2,403	
B. Available Productive Forest Area	Retention of productive area (ha) from	721,276	n/a	FMP Development	>=721,666	726,195	719,995	Table AR-11 shows that the retention of productive forest area by forest unit is being achieved.
C. Barren and Scattered Area	Minimize the total area in B&S (ha)	34,556	n/a	FMP Development	<=34,104	21,257	3,247	2010 assessement completed - total B&S area - 35,102.2 ha
D. Total Forest Area	Maximize the total forest area (ha)	852,567	n/a	FMP Development	>=852,956	863,559	880,955	No change in Total Forest Area.
Indicators of Sustainability								

1. Forest Diversity Indicators of Sustainability								
A. Forest Diversity Indices								
Shannon Weiner Index of Landscape Heterogeneity								
Forest Units	index	1.9337	n/a	FMP Development	> 1.547	1.9316	1.9309	target exceeded
Age Classes	index	2.7201	n/a	FMP Development	> 2.176	2.7563	2.8319	target exceeded
Habitat Units	index	1.8324	n/a	FMP Development	> 1.466	1.8349	1.8289	target exceeded
Simpsons Index of Landscape Heterogeneity								
Forest Units	index	0.7977	n/a	FMP Development	> 0.638	0.7967	0.7927	target exceeded
Age Classes	index	0.9272	n/a	FMP Development	> 0.742	0.9260	0.9344	target exceeded
Habitat Units	index	0.7523	n/a	FMP Development	> 0.602	0.7524	0.7505	target exceeded
Shannon Index of Landscape Eveness								
Forest Units	index	0.7539	n/a	FMP Development	> 0.603	0.7531	0.7528	target exceeded
Age Classes	index	0.8450	n/a	FMP Development	> 0.676	0.8563	0.8692	target exceeded
Habitat Units	index	0.6609	n/a	FMP Development	> 0.529	0.6618	0.6596	target exceeded
2. Multiple Benefits to Society Indicators of Sustainability								
A. Managed Crown Forest Available for Timber Production								
Total All Fus	Bounds of Natural Variation (measured in ha)	721,276.22	n/a	FMP Development	577,332.60	726,194.78	719,995.31	No significant reductions in managed Crown forest area available for timber production.
Bog		-	n/a		-	-	-	
Bw1		8,721.54	n/a		6,977.23	10,968.74	16,520.72	
LC1		3,227.59	n/a		2,582.07	3,292.35	3,454.63	
MW1		4,483.20	n/a		3,586.56	4,056.41	5,406.00	
MW2		56,229.27	n/a		26,404.53	52,537.97	51,006.83	
PJ1		20,380.62	n/a		16,304.50	22,803.05	26,315.02	
PJ2		11,240.57	n/a		8,992.46	9,289.11	5,561.42	
PO1		62,606.48	n/a		50,446.24	68,377.66	76,967.46	
SB1		129,770.12	n/a		103,813.94	136,619.39	147,797.28	
SB3		282,877.03	n/a		226,301.62	285,368.48	290,895.15	
SF1		65,984.29	n/a		19,081.59	60,044.52	37,883.93	
SP1		75,755.51	n/a		28,838.74	72,837.11	58,186.86	

B. Available Harvest Area Available to be Utilized								
Total All Fus	Available Harvest Area in hectares	7,935.21	n/a	FMP Development	100% Utilization	6,130.18	6,689.65	66% utilization to date
Bog		-	n/a		100% Utilization	-	-	
Bw1		23.82	n/a		100% Utilization	38.68	80.83	62%
LC1		-	n/a		100% Utilization	-	-	
MW1		74.69	n/a		100% Utilization	51.54	60.38	98%
MW2		793.88	n/a		100% Utilization	618.51	546.99	62%
PJ1		226.44	n/a		100% Utilization	165.29	219.22	96%
PJ2		212.58	n/a		100% Utilization	117.87	65.92	72%
PO1		585.02	n/a		100% Utilization	453.57	643.39	76%
SB1		471.51	n/a		100% Utilization	587.44	1,274.87	86%
SB3		3,774.93	n/a		100% Utilization	2,652.17	2,626.71	60%
SF1		670.01	n/a		100% Utilization	585.39	393.75	59%
SP1		1,102.33	n/a		100% Utilization	859.72	777.59	69%
3. Forest Cover Indicator Group								
A. Habitat for Selected Wildlife Species 3E1 Sub-unit								
Bay-breasted Warbler	Area of Preferred habitat in hectares, greater than or equal to the Bounds of Natural Variation (exception is the Blue-spotted salamander which is measured using the used habitat in hectares)	79,996.68	n/a	FMP Development	64,680.53	67,161.21	64,681.00	Initial assessment completed during the development of the FMP. Table FMP-12 of the 2005 FMP details the intention of this objective is to measure the habitat levels for the indicator species over time (i.e. starting in 2005 with the first targeted level of achievement measured in 2025). After four years of plan implementation there are no discernable trends to be drawn for this objective achievement.
Black-backed Woodpecker		47,888.09	n/a		38,313.25	49,616.42	47,320.09	
Black Bear Foraging		2,909.25	n/a		2,327.40	3,030.79	2,657.02	
Black Bear Fall Winter		53,080.09	n/a		42,795.94	43,807.04	52,352.59	
Boreal Chickadee		43,839.87	n/a		35,071.89	56,310.03	62,703.24	
Blue-spotted Salamander		585,858.92	n/a		446,836.02	586,408.65	577,894.68	
Lynx		69,080.21	n/a		55,264.17	77,705.92	72,799.34	
Woodland Caribou		5,337.60	n/a		1,725.17	4,627.58	2,276.50	
Deer Mouse		34,310.84	n/a		26,758.99	47,737.35	49,636.20	
Great Grey Owl		13,674.18	n/a		9,689.31	11,668.90	9,883.68	
Least Flycatcher		55,649.35	n/a		45,010.34	66,691.33	70,474.18	
Marten		95,878.75	n/a		76,895.32	88,411.74	91,315.92	
Moose Summer		32,277.57	n/a		25,136.37	44,627.49	46,062.87	
Moose Winter		133,371.35	n/a		73,112.66	124,144.58	112,726.97	
Northern Flying Squirrel		102,198.11	n/a		82,450.00	90,447.92	96,964.07	

Pileated Woodpecker		2,864.28	n/a		2,291.42	7,106.83	3,590.38	
Ruby-crowned Kinglet		243,992.96	n/a		185,624.61	194,610.46	291,164.09	
Ruffed Grouse		17,237.59	n/a		13,929.62	17,869.55	25,314.25	
Snowshoe Hare		69,080.21	n/a		55,264.17	77,705.92	72,799.34	
Spruce Grouse		7,135.54	n/a		3,575.50	6,566.45	7,505.96	
White-throated Sparrow		105,970.33	n/a		59,841.60	105,149.28	105,821.65	
B. Habitat for Selected Wildlife Species 3E6 Sub-unit								
Bay-breasted Warbler	Area of Preferred habitat in hectares, greater than or equal to the Bounds of Natural Variation (exception is the Blue-spotted salamander which is measured using the used habitat in hectares)	32,151.48	n/a	FMP Development	21,915.84	31,353.12	26,474.23	Initial assessment completed during the development of the FMP. Table FMP-12 of the 2005 FMP details the intention of this objective is to measure the habitat levels for the indicator species over time (i.e. starting in 2005 with the first targeted level of achievement measured in 2025). After four years of plan implementation there are no discernable trends to be drawn for this objective achievement.
Black-backed Woodpecker		10,270.57	n/a		7,622.99	11,020.61	8,026.11	
Black Bear Foraging		1,032.28	n/a		825.83	513.61	438.72	
Black Bear Fall Winter		22,354.73	n/a		15,226.64	21,839.92	20,145.32	
Boreal Chickadee		5,122.73	n/a		4,097.15	5,803.16	8,037.20	
Blue-spotted Salamander		76,860.28	n/a		61,244.32	77,453.46	77,435.53	
Lynx		23,929.94	n/a		19,162.60	31,049.51	29,674.67	
Woodland Caribou		1,530.52	n/a		894.60	940.14	839.03	
Deer Mouse		27,731.53	n/a		18,342.54	16,472.07	20,511.86	
Great Grey Owl		7,827.37	n/a		5,672.82	6,982.37	9,096.31	
Least Flycatcher		11,456.66	n/a		9,164.34	10,956.22	14,777.31	
Marten		29,625.48	n/a		19,844.69	29,957.24	24,479.32	
Moose Summer		25,695.05	n/a		13,966.75	15,222.14	18,870.21	
Moose Winter		34,696.26	n/a		18,344.99	33,564.34	32,724.71	
Northern Flying Squirrel		35,774.54	n/a		27,785.91	37,310.94	33,058.28	
Pileated Woodpecker		386.99	n/a		309.59	2,925.84	3,940.87	
Ruby-crowned Kinglet		11,553.67	n/a		8,840.36	10,746.62	20,772.86	
Ruffed Grouse		11,133.32	n/a		8,899.09	11,991.43	13,113.76	
Snowshoe Hare		23,929.94	n/a		19,162.60	31,049.51	29,674.67	
Spruce Grouse		3,278.61	n/a		2,332.64	3,519.99	3,174.92	
White-throated Sparrow		37,819.82	n/a		17,721.51	29,213.56	28,218.46	

Source: 2005-2010 IFF FMP Table FMP-12